The Builder.

VOL. LXI. No. 2537. SATURDAY, SEPTEMBER 19, 1891.

ILLUSTRATIONS.

A Renaissance Pavilion.—Designed by Mr. Ernest Rüntz ..... *Extra-Large Photo-Litho.*
Chartres Cathedral: West Doorway.—From a Drawing by Mr. H. Wilson ..... *Single-Page Ink-Photo.*
Doorway, West Front, St. Wulfran's, Abbeville.—From a Drawing by Mr. H. Wilson ..... *Single-Page Ink-Photo.*
Part of the West Window of Fairford Church.—From a Drawing by Miss Emma Knight ..... *Double-Page Ink Photo.*

Blocks in Text.

Appuldurcombe Hall, I.W., before 1710 ..... Page 220
Arreton, Isle of Wight 220
Yaverland Manor-House, Isle of Wight ..... Page 221
Bridge Court, near Godshill, I.W. 221

CONTENTS.

Architecture of the Isle of Wight 219
American Houses 221
Notes 222
A Year's Work of the London County Council 224
The Trades Union Congress 225
A Renaissance Pavilion 226
Western Doorway, Chartres Cathedral 226
Doorway, St. Wulfran, Abbeville 226
Window, Fairford Church 226
South Kensington Museum Competition 227
Architectural Societies 227
Mortality in Relation to Occupation 227
The Eight Hours' Movement 229
"Rushes as a Key for Plastering" 229
Pneumatic Carts for Emptying Cesspools 229
Stable Drainage 229
The Student's Column.—Marbles, XII. 230
General Building News 230
Sanitary and Engineering News 231
Foreign and Colonial 231
Miscellaneous 232
Meetings 232
Recent Patents 233
Some Recent Sales of Property 233

Architecture of the Isle of Wight.

IT is not easy to find a new field for architectural illustration and sketching in these days, yet Mr. Stone may be said to have practically found one in undertaking the complete investigation and illustration of the architectural antiquities of a place so close at home and so accessible as the Isle of Wight,* affectionately called by the inhabitants of the southern counties "The Island," which has been much overlooked by architectural illustrators, inasmuch as it does not contain any large building of first-class name and fame to act as an inducement to visit it. Mr. Stone has undertaken the task, more (as he says) a labour of love than of profit, of giving a complete architectural illustration of the island, of which the first two parts are now issued. Mr. Stone takes the island in the two halves separated by the Medina river—the West and East Medine—and sub-divides these into ecclesiastical and secular work, these two branches of the architecture of the East Medine being illustrated in Parts I. and II. We presume therefore, on this plan, that the book will be complete in four of these folio parts.

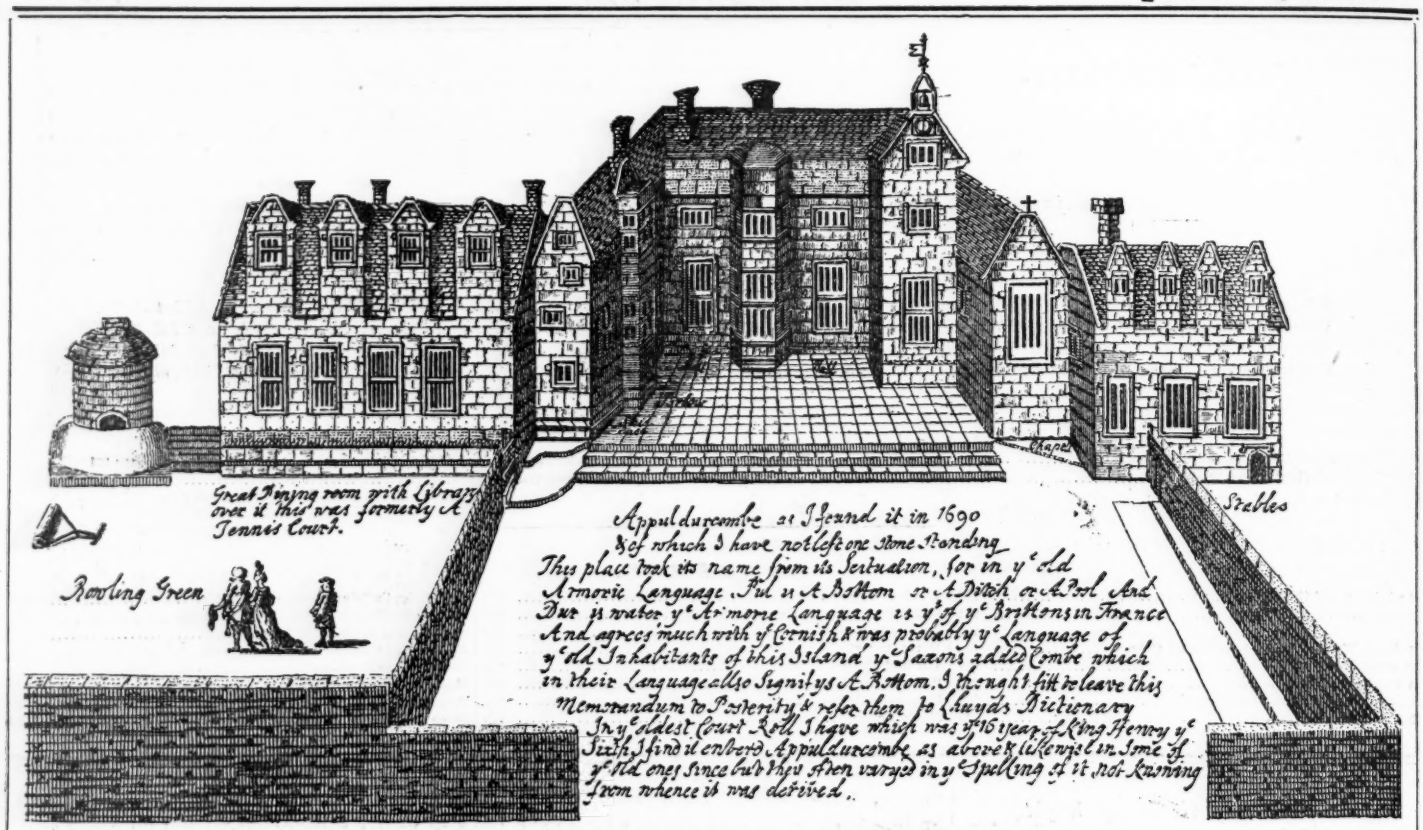
The ancient ecclesiastical buildings of the island are not of very much interest, and probably never were, with the exception of Quarr Abbey, and this now exists only in a very fragmentary state, the parts of the remains that are standing having been converted to use as farm buildings, while of much of it only the footings remain, or even these are gone. The Abbey dates from about the middle of the twelfth century, and Mr. Stone has done good service in drawing out what may be called a basement plan of the remains, putting together, with different shadings, the parts of which foundations or walls are still visible, those which have been found by probing with a bar, and those which must be conjectural only, though these latter can hardly be questioned, in view of the amount of ascertained portions which exist and which give the line and indication for the missing portions. The plan shows the usual type of an early Gothic Church, with transepts and a short choir, and chapels on the eastern side of the transepts, but with the cloister and adjacent buildings on the north side of the church instead of the more usual position on the south. The Chapter-house, of which the whole foundations remain, projecting as usual eastward from the centre of the eastern cloister, is unusually long and narrow in proportion, and divided into three aisles on the model of a church nave, the centre aisle the widest. The author gives restoration elevations of this and the Fratry and the Infirmary Chapel; but he does not make it quite clear how much data exist for these restorations. However, the plan is in itself a valuable record of remains which may very possibly disappear even further in process of time.

About the other churches, in the East Medine at all events, it is hardly possible to be very enthusiastic. They present no very noticeable local peculiarities, and certainly are not striking from their scale or their architectural elaboration. Arreton Church has a certain character from the (comparatively) immense obliquely-placed buttresses at the angles of the tower, which, as the author observes, seem to suggest that there had been a failure of the foundations, or some other special cause which suggested these disproportionate props. We may remark, however, that the church at the old town of Eastbourne, a little inland from the modern watering-place, has a tower of much the same date and size as this, with similar large buttresses, and perhaps further attention to these small southern coast churches may show that there was a fancy or fashion for these large buttresses in that part of England. The plan of the church is peculiar; there is a very short nave, the outer walls forming almost an exact square, with three bays and three aisles,—the side aisles a good deal narrower in proportion than is usual; to this is added a chancel, also nearly square, but with two aisles only, and an arcade of three bays up the centre, the whole being planted on quite askew to the nave, and forming a projection on the south side. Here and at Binstead the favourite window design was of a simple early geometrical tracery with circles in the head, each filled with a trefoil. Brading Church, with its nave of five bays and its short stone spire (shown in the perspective view with a very marked entasis, which is not apparent in the geometrical drawing) has more architectural pretensions, and contains also some interesting altar tombs and monuments.* The church at Godshill is also an interesting and picturesque building, very prettily situated among trees, and is an example of the rather rare treatment of the nave in two aisles, with a central arcade. The eastern portion of the north of these two aisles forms the chancel, which is not architecturally in any way separated from the nave, the whole being enclosed in two parallel walls without a break, and the south aisle running on parallel with the chancel to the east wall, which shows a double gable, two windows of similar treatment, and a central buttress between them.

Carisbrooke of course comes into the section of the Western Medine; but even without that salient object, the secular architecture of the island, as illustrated in Part II. of the work, is much the most interesting, and has a certain quality of its own. The once important seat of Appuldurcombe, now an "Academy for Young Gentlemen," but which has been the home of four Captains of the island, is chiefly interesting now for the contrast between what it is, architecturally, and what it was. The old house is shown in a facsimile of the drawing made by (or by order of) the Sir Robert Worsley who succeeded to it in 1690, and forthwith pulled it down and erected on its site a low flat Palladian structure with pedimented wings, engaged pilasters, and a

* "The Architectural Antiquities of the Isle of Wight, from the XIth to the XVIIth Centuries inclusive." By Percy Goddard Stone, F.R.I.B.A. London: published by the Author. 1891. Parts I. and II.

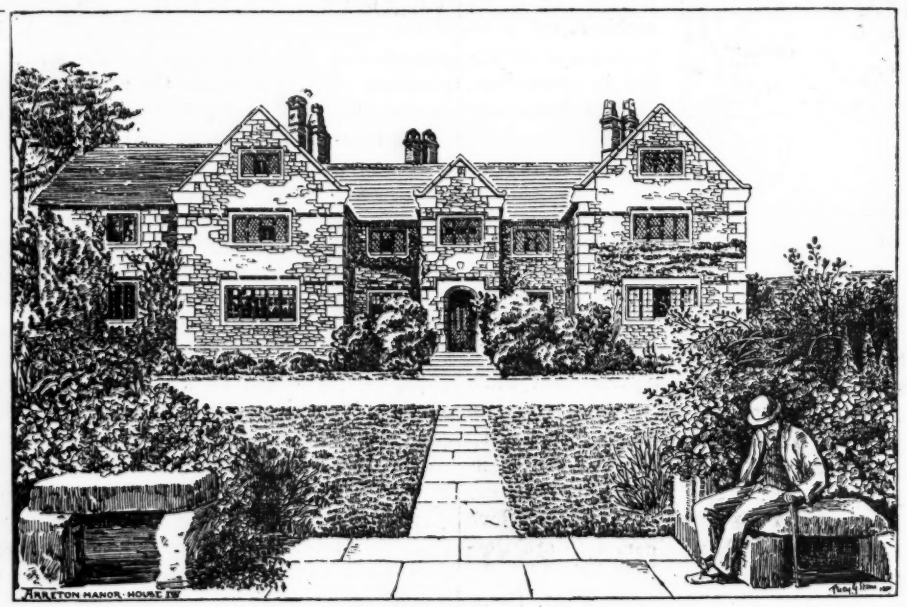
* There exists at Brading one curious relic not often met with now, viz.: a "bull-ring," in the open space of the small town; a strong iron ring with a shank embedded in the ground, to which the unhappy bull was tied for the sport of bull-baiting.


Great Dining room with Library over it this was formerly A Tennis Court.
Bowling Green
Stables
Chapel
Appuldurcombe as I found it in 1690
& of which I have not left one Stone Standing
This place took its name from its Sertuation, for in y^e old
Armoric Language Pul is A Bottom or A Ditch or A Pool And
Dur is water y^e Armoric Language is y^t of y^e Brittons in France
And agrees much with y^e Cornish & was probably y^e Language of
y^e old Inhabitants of this Island y^e Saxons added Combe which
in their Language also Signifys A Bottom. I thought fitt to leave this
Memorandum to Posterity & refer them to Lluyds Dictionary
In y^e oldest Court Roll I have which was y^e 16 year of King Henry y^e
Sixth I find it enterd Appuldurcombe as above & likewise in some of
y^e old ones since but they often varyed in y^e Spelling of it not knowing
from whence it was derived.

Appuldurcombe Hall: Drawn before its Demolition in 1710.

recessed centre. The old drawing, which we reproduce, gives an idea of the probable interest and picturesqueness of the house which its owner seems, as Mr. Stone remarks, to have taken a pride in pulling down, though he had at all events sense enough to leave a drawing of it. The writing on the drawing is signed at the foot "Rob. Worsley, 1720," but the signature comes below the bottom line of the engraving. As this writing may not be very easily read on the illustration, we transcribe it and print it here:—

"Appuldurcombe as I found it in 1690, and of which I have not left one stone standing. This place took its name from its sertuation, for in ye old Armoric language, Pul is a bottom or a ditch or a pool, and dur is water. Ye Armoric language is y^t of ye Brittons in France, and agrees with much of Cornish, and was probably ye language of ye old inhabitants of this Island. Ye Saxons added combe, which in their language also signifys a bottom. I thought it fitt to leave this memorandum to posterity, and refer them to Lluyd's Dictionary. In ye oldest Court Roll I have, which was ye 16 year of King Henry ye Sixth, I find it enterd Appuldurcombe as above, and likewise in some of ye old ones since; but they often varyed in ye spelling of it not knowing from whence it was derived."



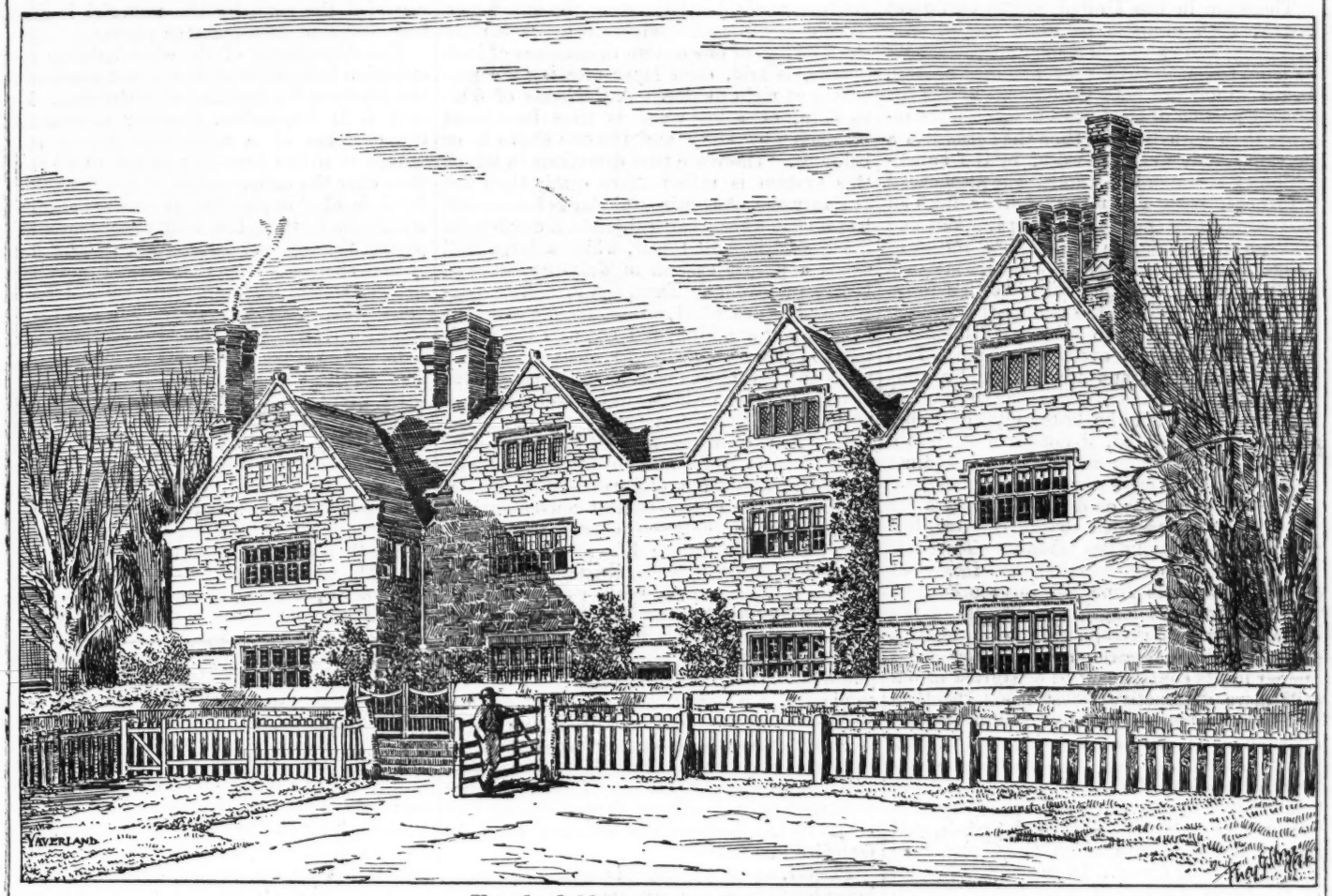
Arreton: South Front.

Appuldurcombe, however, was an exceptional house; Arreton, of which we give the front view, is a more typical example of the old Isle of Wight house. This, it may be said, does not differ materially from the smaller type of English seventeenth-century house to be met with in other parts of the country; still, there does seem to be a certain local stamp about these quiet prim old houses, or at any rate, they impress one so when met with in the course of a drive about the island, though it would perhaps be difficult to define precisely in what it consists; perhaps it may be found partly in the local character of the landscape, of which the house seems to partake. Originally, of course, this house was strictly symmetrical, the portion on the left of the view having been added later. The interior woodwork is very elaborate, and a good example of this class of work of the period, of greater richness than would be anticipated from the quiet and unpretending character of the exterior.

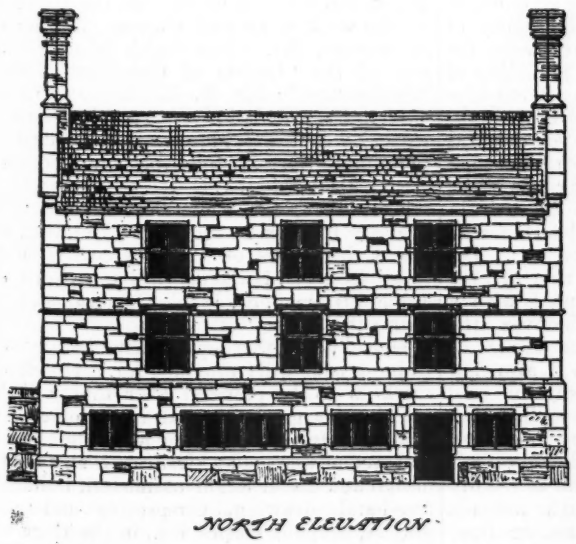
Bridge Court, a house of a smaller type, the author gives as an excellent example of a small yeoman's house of the early part of the seventeenth century. Here we have the same low windows, the same solid, but unpretending character, but the house is roofed with one ridge and eaves from end to end, with no return wings or gables, the front being only broken by a narrow projection in the centre, not cutting into the main roof, the lower portion of which forms a porch, the upper portion of the walls being left blank, except for an inscription stone in a panel. No plan is given, and it is not apparent what use was made internally of this space over the porch; perhaps it served as a store-closet. The windows on the south or entrance front have been modernised, the shape of the openings being altered, and sash-windows inserted; but Mr. Stone gives a restoration of this front as it probably appeared; the other front has been less interfered with. This house, he says, has been hitherto passed over on account of its small size: but we quite agree with the author that it is a very interesting little example of its class. We reproduce the two elevations as restored (see opposite page).

Among the other houses illustrated in the book, one of the most charming is Merston Manor, designed very much on the same lines as Arreton, with end wings and a small porch projection in the centre. Stenbury Manor is a pretty old farmhouse-looking residence; but one of the most charming is Yaverland Manor House, of which we also give an illustration, a reduced copy of the print in the volume. This shows the arrangement of a projecting wing at each end, as at Arreton, but the little porch projection in the centre is wanting, and the entrance is by a door inserted in an unostentatious manner near the centre of the front, with no architectural treatment to emphasise it. This door, as we see from the plan, leads direct into a large hall, filling up a great part of the centre of the building, and lighted by the long mullioned window seen on the right of the door in the drawing.

We shall look with interest for the two succeeding Parts of Mr. Stone's book, which will complete an exceedingly interesting publication illustrating a corner of the kingdom which has been rather unduly neglected by architect and archæologist. Mr. Stone writes, as he tells us, from an acquaintance with the island extending over many years; his notes on the buildings contain a great deal of historic information, and the illustrations are very well executed. In every respect the book is a welcome addition to an architectural library.



Yaverland Manor-House: Entrance Front.



Bridge Court, near Godshill.

AMERICAN HOUSES.

IT is still a widespread idea in these islands, with those who have not visited the United States, that American houses are for the most part built slightly of wood, and that, were it not for the existence of those efficient fire-brigades, the fame of which has reached us, there is nothing to prevent them from becoming at any instant the prey of a conflagration. In this idea there is something both of truth and untruth. As wood is, throughout the States east of the Mississippi, the cheapest and most accessible building material, most of the dwellings in villages, at sea-side resorts, and in the poorer suburban districts of large towns, are built of it. Throughout California, the wholesome dread of earthquakes has led to the erection in wood of mansions of the largest size. In the States and Territories west of the Mississippi, especially between that river and the Rocky Mountains, stone and brick are as yet somewhat scarce, and houses are for the most part of wood imported from the Eastern States. But it may confidently be asserted that, in the great majority of wooden houses erected, more care is taken in construction than is usually bestowed upon English houses of the same class; the walls, lath and plaster within, and covered without with weather-boards or "rustic" boarding, keep out heat, cold, and damp more efficiently than the 9 in. brick wall of an ordinary English cottage; the floors, even in the poorest cottage of tongued and grooved boards, are vastly preferable to our "straight-joint" flooring; the roofs, sheathed throughout with boards beneath the outer layer of tiles, slates, or shingles, exclude the wet much better than the narrow strips in ordinary use here; and the house itself is usually lifted higher from the ground, and better ventilated underneath. These points are those of the poorest quality of wooden dwellings; in those of a better class, the floors are double, an under layer of second quality grooved and tongued flooring, an upper of the best quality, carefully picked, and planed over after laying. Between the two thicknesses of boarding is often interposed a layer of specially-prepared Manilla paper. Upon the roof, similar, often thicker, Manilla, or "raw-hide" paper is laid, so as to absorb every particle of moisture that may chance to pass through the interstices between tiles or shingles. The outer walls are sheathed with a double thickness of boarding, the inner tongued and grooved, and often laid diagonally, the outer of the pattern selected for finish. Often a layer of paper is interposed.

As these are the ordinary modes of constructing wooden dwellings, it is evident that, though they can make no pretence to be fireproof, they are more wind and weather-proof than the best class of English homes.

But the extent to which dwellings are built of wood in the United States is much less than is thought in England. Except in California, where wood is used for the special reason mentioned, not only all dwellings in the solidly-built streets of the centres of the cities, but also the whole of the vast class of suburban houses, from the mansion of the millionaire down to the cottage of the labourer, are built of mineral materials,—stone, brick, terra-cotta, just as in the British Isles, with, however, floors and roofs constructed as have been described, and thus incalculably superior to ordinary English floors and roofs. Throughout much of Pennsylvania a wooden house is as rare as it is in England; Philadelphia and Baltimore are brick cities, and though wooden houses can be found in certain localities in New York, one can travel for miles without seeing any

There are in the United States two great causes, both climatic in their origin, why disastrous and extensive conflagrations should be more frequent than they are in England. In the winter the cold throughout by far the greater portion of the States is much more intense than with us, and thus the furnace is a necessity, only to be got rid of by the substitution of steam or hot-water. The presence of a furnace, with a system of hot-air flues of galvanised iron encased in the partitions and walls, is, of course, an ever-present source of danger, and is scarcely less dangerous in a brick or stone dwelling with wooden floors and roof, and with all the trumpery of wainscoting which appears to be more fashionable in America than it is even in England. This is the first cause, and its universality has prompted Americans to endeavour to discover methods by which the latter class of structures can be rendered, if not proof against a general conflagration, at least proof against any fire likely to arise upon the premises.

The second cause of disastrous fires is for the most part confined to the country, but upon many occasions has made its effects felt in large towns surrounded by forest or prairie. It arises from the intense heat of summer, from the length and dryness of the crowded bents of grass, and from the facility with which a prairie fire, meeting with timber in its course, may be converted into a still more destructive forest fire. Dwellers in the ever-damp climate of Britain, where every field is girt by a living hedge, and where almost the only trees are those which form a line along the fences, cannot have the faintest idea of the force and the sweep of a fire over an extensive area of dry grass, still less of the fury with which the flames rage through a wide forest. In summer the scent of the burning woods of New Jersey, though at least forty to fifty miles distant, is borne to Philadelphia, and the haze of the smoke can be seen.

The exigencies of the climate of the whole of the northern and central portions of the United States are such that the inhabitants are compelled to spend more money upon their clothing, and also more upon their houses, than is the case in England. This has caused great refinements in the plan, and considerable improvements in the construction, of an ordinary dwelling. The English suburban house of eight to fourteen rooms may have its entrance-porch, as a shelter from the rain, but the American one has its piazza along the entire length of its front, or on two sides, wide enough to allow hammocks to be slung from post or pillar to wall. The English house has its fireplace in all sitting-rooms and in most of the bedrooms, while the American has both fireplaces and furnace-flues, the former in all living-rooms at least, the latter to hall, staircase, living-rooms, and bedrooms. The high wages of servants have caused great care to be taken to so arrange the kitchen, butler's-pantry or "pass-closet," and dining-room that no needless steps have to be taken in serving the meals; and the bath-room occupies a much more important position in any American house than in an English one. Even a house of five rooms, such a one as an artisan inhabits, has its bath-room, with all appliances complete.

As has been already said, the frequency of large fires has caused considerable attention to be paid to practical methods of fire-proofing. Iron is as much employed in America as it is in England, and all the ordinary modes of protecting the metal from the action of fire and water, such as the enclosure of iron columns in concrete or terra-cotta, and the burial of iron joists in concrete, are also in use in the United States. The great expense of such fire-proofed buildings, together with their unreliability in extensive conflagrations, have been the cause of the origin of a method of construction known as "slow-burning," or otherwise as "mill-construction." The main feature in this system is simply the substitution, for joists placed on edge, of planks laid horizontally. Three or four-inch thick grooved planks, with slip-tongues filling the grooves, are laid solidly over the entire area to be covered, and upon their upper surface the flooring, of one or two thicknesses of inch boards, is laid, each layer crossing the preceding at right angles. A thickness of 5 in. to 6 in. of solid wood is thus interposed between any story and the one above it or below it. There are two directions in which this system is rather more costly than the ordinary one. As horizontal planks have much less stiffness than vertical joists, a cross-beam is required in most rooms, while a large hall needs a proper system of duly-proportioned beams or girders. Then, again, a floor constructed as described affords no concealment to piping of any kind, and compels the architect to expose his gas, water, steam, and other pipes and fittings, as well as all apparatus for electric lighting or bells. The increased cost of the extra beams is not a very important item. Any ordinary room with a width of from 12 ft. to 18 ft., and not more than 20 ft. in length, needs but one cross-beam, which, coming in the centre, is most convenient for the location of the gas or electric chandelier. Any increase in length beyond 20 ft. simply requires additional beams, the under sides of which, if they are of wood, can readily be made to conduce to the effect of the interior.

The exposure of all piping is a clear gain from a sanitary standpoint; but the American public, like the English, is not yet educated to view with equanimity the sight of an iron steam-pipe or water-pipe, even though paint or bronzing may have been employed upon its surface. This has probably been the greatest obstacle to the general use of slow-burning construction in dwellings, though during late years it has become the ordinary mode in factories and mills.

Plaster, as we all know, is among the most incombustible of substances; but lath and plaster nailed on the surface of a partition of wooden studs is sufficiently combustible. In most buildings of the better class, especially public buildings and blocks of offices, the common wood lath has long been superseded in the United States by that of sheet-iron, corrugated, bent or pierced in various ways, mostly patented, so as to afford an efficient key to the plaster. The iron lath of the Cincinnati Corrugating Company has three corrugations in its width, and is pierced with three series of slots. The Stanley Company employs a lathing of corrugated wire, in flat sheets of wire-cloth. Another sheet-iron lath is bent angularly. This fireproof lathing can as easily be applied to the underside of the ceilings of an edifice with solid floors as to one with the usual arrangement of joists, and its employment, with a little ingenuity, can be made, if required, to furnish a space in which wires and small pipes can be hidden.

Those who prefer a thoroughly honest construction can, if they adopt the slow-burning system for floors, roof, or walls, make the interior presentable with paint or staining, or line the ceilings with a superior quality of wainscot, but the general preference for plastered surfaces, and the incombustibility of the material, has led to its more usual employment, in combination with iron lathing.

In the United States this system of solid wooden floors, and even, in districts where wood is the ordinary building material, of solid wooden walls, has been extensively employed, and all the necessary details for its use have been thoroughly worked out. Let any architect endeavour to use this system, and he will find himself confronted with a number of new problems wherever the floors and walls are pierced for stairs or for openings of any kind; he will also find that the system opens out entirely new methods of decoration, and that he must more carefully consider the arrangement and finish of all piping. An "adamant wall plaster," a kind of cement that can be readily applied to wall surfaces, which adheres equally well to lath, brick, stone, or iron, which is strong, which weighs less than lime plaster, which needs little water, and does not crack like common plaster, has also recently come into use in the Eastern States. A room finished one day with it can be occupied the next, for the material is much less absorbent than common plaster.

The advantages of the slow-burning construction here advocated are not confined to the practical fire-proofing of a building. Not only is it impossible, however combustible the contents of a room may be, to start within it a fire that has power to do more than char the under surface of the thick floor, but it is also impossible, in any structure in which the method has been consistently employed throughout, for vermin of any kind to find shelter in the thickness of the floors, roof, or walls. A house with walls of brick, built with a cavity, with floors of solid planks covered with double flooring, with roofs of planks, laid with roofing-paper beneath the slates or other outer covering; with partitions of solid upright tongued planks; with all the interior surfaces of walls and partitions plastered with adamant plaster, while the ceilings are either painted decoratively, stained, or covered with iron lathing and plaster; and with all piping and wires exposed and arranged so as to add rather than detract from the internal effect, would be as nearly perfect a structure as at this present date, using the usual materials, we can imagine.

W. N. L.

NOTES.

THE disastrous flood in the province of Toledo, by which it seems pretty certain that many hundreds of lives have been lost, is only one of a series of catastrophes of late years arising out of the state of the weather. Looking back on the last few years, it seems that we must accept one of two conclusions: either that we are passing through an exceptional period of stormy and rainy years, such as may possibly be recurrent at certain intervals of the world's history; or that the climate of Europe is definitely changing for the worse, and that we must be prepared for climatic conditions such as we have not hitherto regarded as among probable contingencies. At all events, taking the floods of Bohemia last year and the floods of Toledo this year, it seems that a practical lesson must be drawn against building habitations on too low ground along the course of a large river, and that it is time to see that houses are out of reach of what now appear to be probable floods, or that resources for escape must be to hand and immediately available.

THE new educational curriculum of the Architectural Association is now issued in pamphlet form. The whole system of instruction for first, second, third, and fourth year, is first stated consecutively, the names of lecturers in one column and the subjects in another; the time-table for the year 1891-2 follows, and after that the statement of the work of special classes. Among the instructors, Mr. Elsey Smith takes the subject of the "Orders of Greek and Roman Architecture"; Mr. F. R. Farrow, a former holder of the Godwin Bursary, takes the subjects of "Building Materials and Construction, and the History of Architecture"; Mr. R. Holmes, M.A. (Fifth Wrangler, Cambridge, 1885) takes the subjects of "Elementary Physics as applied to Building, and the Calculations of the Strength of Materials," &c.; Mr. H. Hancock (late Scholar and Triple Prizeman, St. John's, Cambridge), takes such subjects as "Plane Geometry and Perspective"; and other departments of study seem to be satisfactorily provided for. The Studio work is to be presided over by Mr. R. W. Schultz, for geometrical drawing of ancient examples, free-hand drawing, &c., in the first and second years; by Mr. J. A. Slater for the design and construction of modern buildings, free-hand drawing, perspective and sciography, graphic statics, &c., in the third and fourth years. Mr. Pomeroy (R.A. Gold Medallist for Sculpture, 1885) instructs in modelling at the Studio, and Mr. W. G. B. Lewis and Mr. Weedon in water-colour. The general terms and regulations are to be found

in the prospectus. The scheme looks very well arranged and the instructors and lecturers well chosen. We should suggest that if possible a corner should in future be found in the fourth year programme for some instruction in regard to electric lighting and other uses of electricity, about which architects will have to know something in the future. In addition to the regularly engaged teachers and lecturers, the following architects have consented to act as visitors at the meetings in the studio for the criticism of drawings:—Professor Aitchison, Mr. Belcher, Mr. Basil Champneys, Mr. Ernest George, Mr. T. G. Jackson, Mr. E. J. May, Mr. E. W. Mountford, Mr. Aston Webb, and Mr. Waterhouse.

PASSING a few days since through Gray's Inn, we noticed some apparently experimental chipping and picking of the stucco which conceals the red brick-work of the hall. We are fain to see in this an indication of good things to come. We trust that the Benchers are minded to supplement some recent interior repairs with a process of rehabilitation without. In a letter printed in the *Gentleman's Magazine* of August, 1826, "E. I. C."* animadverts upon the alterations then being made. The hall was built of red brick, with stone dressings and mullions to the windows, and stone quoins, in the interval 4 & 5 Mary and 2 Elizabeth, at a cost of 863*l.* 10s. 8d., as we read in Dugdale, who quotes certain records no longer extant. Until delivered to what "E. I. C." terms the "modern Carpenter's Gothic school" (compare Wyatt's front to the old House of Lords) it stood, with a highly characteristic big lantern, as a well-nigh perfect specimen after its kind. They set up another wooden lantern, "of entire new design and much resembling a pigeon-house"; put slate for the tile on the roof; laid battlements in lieu of the plain parapets on the side walls; disfigured with over-lapping ledges the battlements, arranged in a series of crow's-nests, and worked in brick, upon the two gables; Gothicised the round-arched porches, and altered the character of the (now older) library, and of the arched passage, then inscribed "T. F. W., 1750," leading from South-square. At the same time they gave a new porch and turret to the chapel, which was rebuilt in pursuance of an order made in 1698. And then by way of a later-day "revel"—for entertainments by which name the Inn was once deservedly famous—covered all over with compo and plaster an inch thick. The architect, we believe, was William Wigg, who, with his partner, Pownall, did far better work at Staple Inn (1843) in designing the two houses on the terrace south of the hall there. The original lantern had a leaden cupola surmounted with a vane, and bore a dial with motto, "Lux Diei—Lex Dei." The interior repairs, carried out under the superintendence of Mr. L. H. Isaacs, architect and surveyor to the Inn, include re-decoration of ceiling of the older library—built in 1738, enlarged in 1840-1—and the substitution of an elegantly-designed coved ceiling in strap-work, pale blue and buff coloured and gilded, for the paper and plaster work in the new library as erected in 1883 after the designs of Messrs. Isaacs and Florence.

THE Edinburgh Museum of Science and Art has lately received from the South Kensington Museum a selection of casts of architectural detail in various styles, the most important of which are from buildings of Cairo of the fifteenth century. There have also been added to the architectural exhibits in the Museum some full-sized casts of entire works. Amongst the most important of these is a cast of the monument to Carlo Marsuppini, by Desiderio da Settignano, from Santa Croce in Florence. The work is replete with beautiful Renaissance detail; the proportions of the general design are very good, and the sculptured figures and bas-reliefs are worthy of careful study. The monument is 12 ft. wide, and 26 ft. in height to the urn which forms the finial over the canopy, under which is the recumbent effigy of Marsuppini. From the Church of San Giovanni, Siena, has been obtained a cast of the font and tabernacle by Jacopo della Querca, with its remarkable series of life-sized statues, statuettes, and reliefs by various artists. The latter comprise (1) the angel appearing to Zacharias, by Della Querca himself; (2) the naming of St. John, by Giovanni di Turnio; (3) St. John in the Wilderness, by the same artist; (4) the Baptism of Christ, and (5) St. John rebuking Herod, by Lorenzo Ghiberti; and (6) the head of St. John being presented to Herod, by Donatello and Michelozzo. Amongst these the works of Della Querca and Ghiberti are pre-eminent. The next cast is that of a late Gothic monument to Uriel von Gemmingen, Archbishop of Mayence, from the Cathedral of that city. The date is 1514, the detail is of a mixed character, and the design is interesting and instructive as an example of the transition from the Gothic to the Renaissance. It is more remarkable as a work of art for the sculptural accessories than for the architectural design. The name of the sculptor does not appear to have been ascertained. The Museum continues to be visited by large numbers of excursionists during the holiday season, many of whom seem to be bewildered by the multiplicity of the works exhibited. A single visit to a Museum such as this is only an incident amongst others of travel, and can hardly be productive of much benefit in the way æsthetic culture, although the recollection of it may stir up the individual to habits of observation when he returns to his usual groove.

* He follows up his attack, by a letter in October, upon changes at Middle Temple Hall. See also Allen's "History of London" (1828), vol. iv. John Carter, the "Architect" who wrote a series of papers printed in that *Magazine* during the period 1798-1817, died in the last-named year.

THE gathering of the representatives of the municipal authorities of the German cities, held at Frankfort-on-the-Main, in connexion with the Electro-technical Exhibition during the last days of August, is generally considered to have been a fairly successful one, especially as some 500 delegates, representing 149 different bodies, took part in the official proceedings. The programme of the three days designated as "congress days" was a very full one; besides the official meetings, lectures, demonstrations, and sight-seeing, a banquet was given by the City of Frankfort, and a luncheon by the managing committee of the exhibition; and there were special performances at the Opera House in honour of the visitors. On the following days some well-managed visits to the different interesting points of the town were made, and there was an evening *fête* given at the neighbouring watering-place, Wiesbaden. The opening address was read by the Mayor of Frankfort, and an address having been read by the President of the Exhibition Committee, the proceedings of the first meeting terminated with a descriptive paper on the Exhibition, read by Engineer Uppenborn, of Berlin. Ober-Ingenieur Andreas Meyer (Hamburg) gave the first lecture; his paper treated of the methods of laying subterranean cables for different purposes side by side under the roadways in cities. The second lecturer was Herr O. von Miller (Munich), who described the different methods of distributing electric lighting and motive power in cities. The final paper was read by Herr Stadtbaurath W. H. Lindley (Frankfort), on the different systems of electric tramways.

THE Charity Commissioners have just finally settled, for formal approval by the Committee of Council on Education, two schemes in respect of the establishment and management of the North-Western (St. Pancras) and Northern (Islington) Polytechnic Institutes. For each of these a governing body is set up, to consist of twelve members, elected by the central governing body under the City of London Parochial Charities Act, 1883, three; by the London County Council, two; by the School Board for London, two; and by co-optation, five. To each Institute will be given an annual sum of 1,500*l.* for investment as part of the yearly subsidy of 5,000*l.* payable under the central scheme. In the case of the North-Western Institute the Commissioners award a grant of 30,000*l.* for acquiring the site and establishing class-schools in the Prince of Wales's-road, Camden Town; a similar grant, 25,000*l.*, is allotted to the Islington Institute in respect of premises in Holloway-road. By a supplementary scheme, also just framed, on behalf of the Royal Victoria Hall, Lambeth, a sum of 1,120*l.* 2s. 4d., at present invested in the name of the Official Trustee of Charitable Funds, is to be sold out in favour of the Governors. The proceeds of the sale are to be applied to the making alterations in the staircases and entrances of the Hall, together with some repairs, decorations, and fittings at Morley College. The old Victoria Theatre—popularly known as the "Vic."—was practically transformed into a People's Palace eleven years since. In supporting its altered character the efforts of Miss Cons, Lady Frederick Cavendish, and the Duke of Westminster, with many others, have been eminent. We referred to the progress made there in a paragraph on August 18, 1888. Two years ago, a sum of 17,000*l.* having been collected, the freehold was purchased as a memorial of the late Samuel Morley, the ground landlord generously remitting 4,000*l.* of the purchase-moneys; and now, aided by the Government grant, the College and Hall take their place among the South London Polytechnic schools.

BY another new scheme, the Commissioners make a re-adjustment, by name of the St. Andrew, Holborn, City Foundation, and under a new governing body of nine, of the parochial endowed charities. These, due regard being paid to certain existing interests, will henceforth be applied to the establishment of not more than ten pensions (half of the number to widows) of 26*l.* a-piece; and to the provision of medical or similar relief, in cases of emergency, to residents within the London Liberty portion of the parish. A companion scheme relates to the parish ecclesiastical charities. They are to be vested in twelve trustees, who are charged to apportion 5,000*l.* stock to a fresh account under style of the St. Andrew, Holborn, Extraordinary Repair Fund, to accumulate by annual instalments of 200*l.* a capital sum of 7,500*l.* for a Replacement Fund, and to devote a residue to the ordinary maintenance, repair, &c., of the church, graveyard, rectory, and court-house. The ecclesiastical and general charities of St. Andrew's are forty in number. They comprise the school: and endowments by the learned Edward Stillingfleet, Bishop of Worcester, formerly Rector, as was Sacheverel; John Thavie; and Lady Elizabeth Hatton, daughter to Henry (Cecil), first Earl of Exeter, and widow to the nephew and heir of the renowned Sir Christopher, of Hatton House. Her tragical end, at the hands, so the story goes, of the evil one, is said to have given its name to Bleeding Heart-yard. John Thavie, citizen and armourer, *temp.* Edward III., was a considerable benefactor. He demised some now valuable house property for the maintenance and repair of the church, rectory, and vestrymen's court-house. In the new court-house has been preserved a fine Jacobean mantelpiece, formerly in the inquest-room; around it was fixed up, in no very good taste, a beautifully-carved organ-front from the church. To St. Andrew's was removed the organ, by Harris, which had been rejected after the memorable trial against Smith's instrument at the Temple. Wren repaired the fabric, after the Great Fire, at a cost of 9,000*l.* Gothic windows, and an arch, remain in the tower (begun 25 Henry VI.), which he altered in 1704. The northern end of St.

Bride's-street, with the new rectory and schools, cover site of the old church-yard; in the backyard of No. 16, St. Bride's-street may still be seen a piece of the churchyard wall. This parish originally consisted of three Liberties,—one in the City, another, the Upper, above Bars, and another, the Nether,—Saffron-hill, Ely-rents, and Hatton-garden. In 1723 the ecclesiastical parish of St. George-the-Martyr, Holborn, was formed out of St. Andrew's: Orders in Council of 1839, 1862, and 1867, took the ecclesiastical parishes of Holy Trinity, Gray's Inn-road, and St. Alban, Holborn, and St. Peter, Saffron-hill, out of the Upper, Saffron-hill, and City Liberties; and formed the parish of St. John-the-Evangelist, Holborn, out of Upper Liberty, with parts of St. George-the-Martyr and St. George, Bloomsbury. The remainder of Upper and City Liberties constitute the present ecclesiastical parish of St. Andrew.*

IN the *Times* of Tuesday a writer who signs himself "A. B. B.—J.," a signature which one seems to recognise, gives some charming quotations, exceedingly well-timed at the present moment, under the heading "An Object-lesson in the Eight-hours Question." People who have not quite lost their heads on the subject have occasionally wondered how, supposing a majority of us are agreed that it is best for the human race not to work more than eight hours a day, this *régime* is to be enforced universally. The quotations given by "A. B. B.—J." from the evidence of the secretaries of certain Railway Employés' Unions, given before a Select Committee on the Working Hours of Railway Servants, throw an interesting light on the prospects of individual freedom and liberty if the ideas of the eight-hours fanatics are ever carried out. *Ex. gr.*:—

"Question: Do I understand you to say that a man is not to be allowed to earn any money even if he wishes, after he has completed his eight hours?—Answer: Yes.

Is that to be put in the Act of Parliament?—Answer: Yes.

You say he might make shoes for his children; but if he should make shoes for a shop, what penalty would you inflict?—Answer: I could not say.

But there would have to be a penalty?—Answer: Yes.

You think that a railway man who employed his time in cobbling shoes should be fined?—Answer: Not for his own family.

But if he is doing it for a shop?—Answer: If he is doing it for a shop he ought to be punished."

In answer to somewhat similar questions another witness of the same class said:—

"However anxious a man might be to work more than the allotted time, he ought not to be allowed to do it.

Question: For what reason?—Answer: Because, if it is thought proper to limit the hours of labour by legislation, we should adhere to it as strictly as possible.

Question: Would you forbid a porter working more than ten hours?—Answer: Yes.

Question: On what grounds would you do that?—Answer: Because I think, if he had worked his ten hours, he would then have done a fair and reasonable day's work for the company that was employing him, and that, in view of social and other purposes, he ought not to be allowed to work any more."

This is a plain and significant statement of what the "Eight Hours Movement" really means in the eyes of some of those who are clamouring for it; and a delightful prospect it holds out for personal liberty, should these social fanatics ever get their own way. This, however, we much doubt. The world has not entirely gone mad yet.

PROPOSED NEW MEDICAL COLLEGE FOR ABERDEEN.—A proposal has been made that a new medical college should be built in Aberdeen, in place of extending Marischal College, at a cost of something like 17,000*l.*, and at a meeting of representatives of the University and the Town Council held on the 7th inst. the project was discussed.

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* In this church was baptised the late Lord Beaconsfield, then living in Theobald's-road. In Allen's "History of London," vol. iii. (edition 1828), will be found a full account of the mantel-piece; he says the Royal Arms are those of King James I., and that it is "one of the handsomest and most highly-decorated chimney-pieces in the Metropolis." Thavie's arms, in east window, south aisle,—*az.* on a bend *gu.* 3 garbes *or*, a chief *sa.* charged with a "*T.*" *arg.*,—was done by W. Price in 1731.

A YEAR'S WORK OF THE LONDON COUNTY COUNCIL.

THE London County Council will resume its weekly meetings on the 29th inst., after the summer recess; and inasmuch as the present Council has, by the County Council Elections Act, passed this session, had its life prolonged to March next, instead of expiring in November, as was originally intended, there is much useful work that can be done by the Council for London in the next six months. Let us hope that it will be done, and not merely talked about.

We are far from wishing to imply that the London County Council has not done much good work already; but it has not always added lustre to its fame by the manner in which its decisions have been arrived at. The amount of talk has often been very disproportionate to the work done. This is perhaps in some degree to be accounted for by the fact, that very frequently, reports involving not only heavy expenditure, but important questions of principle, are presented by committees for discussion at very short notice. Even when the conclusions and recommendations of a committee are well founded, many other members of the Council not on a committee presenting an important report want to know the why and wherefore, and their zeal for what they call "economy" and "the interests of the poor ratepayer" being sometimes greater than their knowledge of the particular subject in hand, they oppose the committee's proposals, and if they do not defeat them *in toto*, they sometimes succeed in maiming them to such an extent as to render them comparatively useless.

The fact is, that the great bulk of the work of the London County Council is only nominally and not really done by the Council collectively (although no doubt the Council collectively is responsible); the work is actually done by standing committees, sixteen or eighteen in number, and by two or three special committees. Owing to its great bulk and its voluminous details, the business can, indeed, only be adequately considered in committee; and the Council collectively, in a sitting of four hours weekly for about two-thirds of the year, can for the most part only merely endorse and register the proposals of its committees, or oppose them without adequate knowledge. Neither course is in the public interest.

We have before us as we write, "The Annual Report of the *Proceedings of the* Council for Year ended 31st March, 1891." We have italicised three words in this title, because, when taken with the contents of the Report, they confirm and justify what we have said in the preceding paragraph. For of what does this Report (which practically covers the second year of the Council's work) consist? Not of a report representing the collective opinions of the whole Council, signed by the Chairman in their name; but of a long series of reports on the year's work presented by the various committees, signed by the Chairmen of those committees, and put forward, apparently, on the responsibility of those committees alone, without any further endorsement or adoption by the Council than is implied by their being collected together and prefaced by an address by the Chairman, Sir John Lubbock,—an address which, however admirable it may be as a general sketch of the duties and labours of the Council, does not pretend to describe in detail the work of the Council, and does not serve the purpose of a conspectus of that work in its many ramifications. In this respect, it seems to us, the County Council has not improved upon the practice of its predecessor, the Metropolitan Board of Works, which, during the last few years of its existence, issued admirable annual reports, succinctly describing its works and its liabilities. Those reports annually brought to a focus the results of the labours of all the committees of the Board, and they were elucidated in detail by appendices consisting of the annual reports of the Chief Engineer, the Superintending Architect, and other officials. The County Council's plan of merely collecting and binding together *disjecta membra* in the shape of its committee's reports is no doubt less troublesome in itself than it would be to get the Council as a body to agree to a corporate report; nor must it be forgotten that the London County Council has a much wider range of duties to fulfil than was imposed upon the Metropolitan Board of Works.

Let us now look a little in detail at some of the multifarious work recorded in the report, or rather series of reports, now before us, which cover in the aggregate nearly 100 closely-printed large quarto pages. Many of the chief matters of interest to architects, surveyors, builders, engineers, and sanitarians have been dealt with (some of them at considerable length) as they came up in our weekly reports of the proceedings of the Council, so we need touch but lightly upon them here.

The Chairman of the Council, Sir John Lubbock, in the address which we have mentioned, and which was delivered at the meeting of the Council on June 2 last, commenced by showing the magnitude of the financial arrangements of the Council. For instance, for the current year 1891-92, the total income of the Council is estimated at nearly three millions sterling (2,844,000*l.*), of which sum 1,581,000*l.* is to be raised by rate. The total estimated expenditure is 2,774,000*l.*, of which 1,000,000*l.* will be swallowed up for interest of debt, and 457,000*l.* for repayment of debt. 236,000*l.* is to be spent on main drainage, 176,000*l.* on lunatics, and 135,000*l.* on the Fire Brigade, whilst the Council's estimated contribution to the Poor Law Guardians towards the support of in-door paupers is set down at no less a sum than 329,000*l.* It will thus be seen that the Metropolitan budget is larger than that of many a foreign State. On the perennially interesting subject of rating, Sir John refers to the complaint so commonly made that the Council has "greatly raised the rates." He says that "the true increase is really a halfpenny" (in the pound). He makes this out in the following way:—He says that while the last rate levied by the Metropolitan Board was 10·1d. in the pound, to that rate must be added (*a*) the cost of services formerly provided for by the County Justices in the old County Rate, 1·63d.; (*b*) new charges not borne by the late Board, ·37d.; and (*c*) payment to the Guardians of the Poor of 4d. per head per day for indoor paupers (this being in relief of local Poor Rates), 2·39d., making a total of 14·49d. in the pound. Deducting 2·49d. in the pound on account of the increased Exchequer contribution, and ·8d. on account of the reduction of the Council's balance, there remains the figure of 11·2d. in the pound, against the County Council's rate of 11·75d. in the pound, showing a net increase of ·55d.

Nevertheless, there is in some quarters a decided impression that London rates have greatly increased under the *régime* of the County Council. Whether and how far that increase is due to re-assessment on increased valuations, or to strictly parochial or district rates, are questions the discussion of which do not fall within our province.

The Council's debt (not the whole debt of London, which amounts to nearly 40,000,000*l.*) amounted, on December 31, 1888, to 16,972,469*l.* The amount of debt per head of population is 9*l.* 3s. 8d., as against 10*l.* 1s. 8d. for Birmingham and 8*l.* 2s. 5d. for Manchester (omitting in both cases the sums spent on water and gas); and as against 32*l.* 5s. 3d. for Paris, 24*l.* 10s. 7d. for Boston, U.S., 16*l.* 13s. 3d. for New York, and 7*l.* 11s. 9d. for Vienna. These figures are given by Sir John Lubbock on the authority of Mr. Arthur Gunn, the Comptroller of the Council, and Mr. Gomme. Sir John omits Liverpool from his cited instances "because the finances of that city have been so greatly aided by the town dues," and he says, on the authority of Mr. H. R. Grenfell, that Lord Palmerston once said that in the motto of Liverpool, "Deus nobis hæc otia fecit," the first word ought to be not "Deus," but "*Dues*." As to the question of annual expenditure per head of population in the various cities before mentioned the figures given are as follow:—London, 2*l.* 7s. 9d. per head; Birmingham, 2*l.* 16s. 5d.; Manchester, 3*l.* 4s. 7d.; Vienna, 3*l.* 2s. 10d.; Paris, 5*l.* 4s. 7d.; Philadelphia, 3*l.* 16s. 11d.; Boston, 6*l.* 2s. 3d.; New York, 6*l.* 3s. 4d.* Thus it will be seen that the figure for London is the lowest on the list,—a fact which Sir John regards as creditable to London,—not to the County Council, for they had not been long enough in existence, but to the Corporation, the Vestries, and the late Metropolitan Board of Works.

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* Sir John says that, as regards the American cities, in calculating the expenditure it has been assumed that receipts and expenditure for gas and water equalled one another; and in the cases of Manchester and Birmingham, if the amounts raised for gas and water were included, we should have to add in each something over 4,000,000*l.* As regards the American cities, he had found it impossible to separate the debt incurred for water and gas.

We pass now to some of the reports of Committees, taking them in order. The Finance Committee has statutory duties imposed upon it by Section 80 of the Local Government Act, 1888, and exercises a weekly supervision over the spending committees. The Committee in their report state that the present annual rateable value of the County of London is, in round numbers, 33,000,000*l.* sterling.

The Bridges Committee report the various steps in the consideration of the Blackwall Tunnel project, the upshot of which was that, on the recommendation of the Committee, supported by the opinion of Mr. Binnie, the Engineer to the Council, in consultation with Sir Benjamin Baker and Mr. Hutton Greathead, the Council sanctioned the preparation of drawings and specifications for a tunnel not more than 27 ft. external diameter, and not less than 23 ft. internal diameter. In July, 1890, the new Battersea Bridge was completed and opened. Several of the old bridges have been under repair, and the Woolwich (Free) Ferry has been working with success, though at times it was seriously interfered with by fogs. During the year, 4,332,978 passengers, and 209,849 vehicles, were conveyed across the river. By the Thames River (Prevention of Floods) Act the Council has under its jurisdiction a river frontage of forty-one miles.

The Building Act Committee held forty-one ordinary meetings during the year, twelve subcommittee meetings, and, during the vacations, three meetings (with special powers). Among the subjects which were receiving the consideration of the Committee at the date of the report was that of the revision and consolidation of the Building Acts, and it has since been authoritatively announced that an important measure to this end is likely to be brought before Parliament next Session. As the Committee point out, many anomalies and difficulties have already been overcome, and several deficiencies supplied, by the new By-Laws framed by the Council under their General Powers Act of 1890. We gave the draft of these By-Laws, as finally amended, in the *Builder* for July 11 last, p. 32. For the administration of the Building Act, the Metropolis (including the City) is now divided into 74 districts, each superintended by a District Surveyor. From the summary of monthly returns of these officials for the year ending December 31 last, the new buildings in respect of which fees were received numbered 6,618, and the fees for the same amounted to 15,449*l.* 15s. 2d. "Additions and alterations" numbered 11,494, and the fees in respect of them amounted to 15,077*l.* 0s. 4d. Some 4,250 "arrear" works and their fees bring the totals for the year up to 22,375 works and 38,436*l.* 14s. 10d. in fees. New conditions as to the tenure of District Surveyorships have been imposed, one of them being that District Surveyors henceforward to be appointed shall give the whole of their time to the duties of their office, and shall not practise as architects or surveyors on their own account. This is a regulation which, as we have already said more than once, is of doubtful expediency and utility.

The Corporate Property, Charities, and Endowments Committee have, with certain exceptions, the management of the land and buildings belonging to the Council, and they record the results of the sales by auction of surplus lands on the line of new street improvements.

The Fire Brigade Committee report the steps taken to increase the number of fire-engine and escape stations, renewal of engines and appliances, &c. The total strength of the Brigade at the date of the report was 822 men. There are now 55 fire-engine stations, besides 52 street stations with hose-carts, 176 fire-escape stations, and four river stations. The fires of 1890, compared with those of 1889, show an increase of 217, and, compared with the average of the last ten years, an increase of 422. Only 6 per cent. of the total number (2,555) of fires in 1890 are returned as "serious."

The Highways Committee had a very busy time of it in connection with Electric Lighting Acts and Orders, and tramway schemes. Terrible as has been the confusion of the London streets during the last year or two, owing to the operations of the electric-lighting companies, it is evident that things might have been much worse but for the supervising powers which the Council, through this Committee, has been able to exercise.

The Housing of the Working Classes Committee have been largely occupied with improvement schemes under the Housing of the Working Classes Act. Of the largest of these schemes (Boundary-street, Bethnal-green and Shoreditch) we have already given detailed particulars in the *Builder*. The Committee has also recommended the erection of what is called a "municipal lodging-house," which must not be read to mean anything in the nature of a town-hall or hôtel-de-ville: it is simply a model lodging-house in Drury-lane for tramps and poor wayfarers. The recommendation was adopted by the Council, and the work has been commenced. A competition was initiated, and we published the plans and description of the accepted design, of which Messrs. Gibson & Russell are the architects, in the *Builder* for June 20 last.

The Improvements Committee have been engaged in supervising the carrying-out of a number of street improvements initiated by the Metropolitan Board of Works, of which the most important is Rosebery-avenue, leading from the Holborn Town Hall towards Islington. They have also been busy in preparing new schemes still under the consideration of the Council.

Of the work of the Industrial and Reformatory Schools Committee, the Asylums Committee, the Local Government and Taxation Committee, and the Theatres and Music Halls Committee, we have no room to speak, and we must content ourselves with making brief references to the work of two or three other committees.

The Main Drainage Committee has for a long time had under its consideration the very difficult question of improving and supplementing the existing main drainage system, so as to prevent the serious floodings to which some parts of the metropolis are subject on the occasion of heavy and sudden rainfalls; and they have also had to give attention to the vexed question of sewage disposal and outfalls, with a view to the improvement of the condition of the river. Since the date of the Annual Report the Committee has reported to the Council recommending the execution without delay of new works costing in the aggregate upwards of 2,000,000*l.*, and we believe that some part of these works will be put in hand without very much more delay.

The Parks and Open Spaces Committee are very active in looking after the now numerous and many of them extensive parks and open spaces which are under their control. They refer to the gifts of parks by Mr. Minett (Myatt's Fields), by Sir Sydney Waterlow (Waterlow Park), and by the Governors of Dulwich College (Dulwich Park), and to the acquisition of Brockwell Park, Herne Hill. The Committee is sometimes twitted in the Council with being "extravagant"; be those complaints well-founded or not, it is certain that no part of the Council's work is more generally popular. Sometimes, however, the Committee has erred in its treatment of some of the open spaces confided to its care; it is not every bit of open space that is improved by interfering with it.

The Parliamentary Committee has, as usual, had its hands full of work. Perhaps the most important Bills engaging its attention were those promoted by the Corporation and the Vestries in connexion with the pressing problem of improving and extending the London water supply. As we have already given the details of these measures in full we need not summarise them here. None of the Bills were passed, but the result of the discussion of the question has been to force it upon the attention of the public, and the whole question will come up again next session.

Even from this necessarily limited survey of the work of the London County Council, it will be seen how great are the interests committed to the keeping of that body, which, judged by the words of some of its members and friends, prides itself upon its incorruptibility. But something more than incorruptibility is needed, viz., the ability to grasp, in some degree, at any rate, the essential points of the questions coming before it. This quality is especially needed in view of the fact that, as we have already stated, the work of the Council is necessarily mainly done in committee. Let the electors bear this in mind in March next, and return the best and most capable men who offer themselves, irrespective of party considerations.

SANITATION AT GRAVESEND.—We are obliged to hold over our report of a recent visit of the Association of Public Sanitary Inspectors to Gravesend.

THE TRADES UNION CONGRESS.

WE continue our notes of the proceedings of this Congress, which terminated on Saturday last.

The Eight Hours' Question.

A long debate took place on this question, after a preliminary skirmish as to the mode of voting.

Mr. Matkin moved the following resolution:—

"That in the opinion of this Congress the time has arrived when the Government of the United Kingdom should endeavour to bring about, in conjunction with all foreign Goverments, an international reduction in the hours of labour to eight hours per day; and, further, demand the convocation of an international conference for the purpose."

He said he did not wish it to be understood that that resolution would in any way supersede any resolution that might be moved with regard to a legal eight hours working day in this country. It had been heard in Congress, it had been heard in the press, and throughout the land, that one of the great objections to an eight hours day was that their Continental brethren were working much longer. He had not heard any one of those who were opposed to a legal eight hours day deny that eight hours were sufficient, and he felt certain that they would agree with him when he said that the productive powers, not only of this country, but of the world, was quite sufficient to meet the demands that were made. If that were the case, why on earth were we so idiotic as to go on year after year some working fourteen, fifteen, and sixteen hours a day when, by a conference of the various powers, an improvement could be brought about which would benefit the whole of the human race?

Mr. W. Owen seconded the motion.

Mr. Keir Hardie proposed to preface the following words to the resolution:—"This Congress re-affirms the decision of last year's Congress relative to a legal eight hours day, and further." Then they came to the present motion, "That in the opinion of this Congress," &c. He proposed to add these words, which merely upheld the position arrived at last year at Liverpool. It seemed to him that to pass the resolution as it now stood would preclude the possibility of the legal question for that country being raised at a later stage, and thus he had taken the liberty to submit the amendment. They were not prepared in that country, he hoped, to wait until the autocratic power of continental States could come to the point of granting to their workmen a legal eight hours day. He was not going to discuss the arguments in favour of getting an eight hours day by Trades Union effort alone. In every nation and amongst the people of every nation the demand for an eight hours day was growing and increasing, and he trusted that they in that country would set an example which every civilised nation in the world would follow.

Mr. Curran seconded Mr. Keir Hardie's amendment.

The amendment was carried by 232 for, to 163 against.

The debate was continued on Thursday, the 10th inst., when, after a number of other amendments, the following proposition was moved,—

"That in the opinion of this Congress any Bill for a reduction of the hours of labour should be of a permissive character, and should not be put into operation without the consent of at least two-thirds of the organised members of any trade."

Subsequently, Mr. Keir Hardie moved, as a further amendment,—

"That legislation regulating the hours of labour shall be enforced on all trades and occupations, save where a majority of the organised members of any trade or occupation protest by ballot vote against the same."

The amendment was carried by 285 against 183,—a majority of 102. Subsequently the amendment, on being put as a substantive motion, was carried by 341 to 73.

Employers' Liability Bill.

Mr. W. Matkin moved:—

"That this Congress expresses its strong dissatisfaction with the Government for not giving facilities for the consideration of the Bill to amend the Employers' Liability Act, 1880, introduced by Messrs. Burt and Broadhurst, M.P.'s, during the last Session, and urges upon the Parliamentary Committee to press forward the measure again next Session; and seeing that so little attention is paid to the urgent and repeated representations made to the Government on behalf of Congress to deal with this question on the lines of the proposed Bill, we urge upon the various societies and trades councils to make this a test question at the next general election."

He said that last year they instructed the

Parliamentary Committee to draft a Bill and to urge all they possibly could to put it into law. That had been done, but with very little effect. The Bill that they had drafted might not have been before the whole of the trades of the country, and therefore they were not fully conversant with it, but he might inform them that it contained the instructions that had been given by the Congress year after year. The Government had promised to deal with the question last session, but they failed to do so, and his opinion was that they would fail to do so until greater pressure was brought to bear upon them. That could only be done, to his mind, at the next general election. He believed that if the Trades Councils and the delegates there assembled would exercise their influence on the candidates who were seeking their suffrages, they would have no difficulty even in passing a Bill of that description. The Bill dealt with the question of the abolition of common employment, and provided that action could be taken within twelve months. It also extended the action to seamen, railway servants, and other workmen. Little need be said as to the necessity for the amendment of the existing Act. They had it recorded that 388 cases had been tried during the past year, and in only 109 cases was any compensation granted, and that only to the extent of 8,678*l.* 14s. 6d., or 79*l.* per case. If they could also have recorded the law charges in connexion with those 388 cases, he was inclined to think,—he had no hesitation in saying,—that the 8,000*l.* which had been recovered would nothing like meet the law charges. If such were the case, he submitted the Act was a fallacy, a fraud, as it were, on the working class. If time permitted, he could give cases which had occurred in his own knowledge in the past twelve months in which they had paid more for law charges than the amount of compensation they had received. Employers were allowed to contract themselves out of the Act by insuring themselves, and it was not the employers they had to fight but those large Insurance Associations. They took the cases from one court to another, and they rendered it almost impossible under the present Act to obtain compensation in any just or legitimate case. Therefore he contended that it was a great injustice, and that greater attention should be paid by members of that Congress to the importance of going upon the lines of that resolution, and insisting upon having a pledge from the representatives who were seeking their suffrages. He trusted they would do all they possibly could in the direction of the resolution, because he did not anticipate that the Government would attempt to bring in any Bill: they would not face the country on an Employers' Liability Bill.

Mr. Fairbairn seconded the motion.

Mr. Leonard Hall said he was prepared to support the resolution provided his suggestion be adopted. It was that it be an instruction to the Parliamentary Committee to consider an amendment to clause 5, of Mr. Burt's Bill, with a view of modifying the right of successive appeal, so unscrupulously used by wealthy defendants in defeating the ends of justice. As one of the representatives of the organised labour, outdoor and at public works, and representing one of the younger and less wealthy unions, he asked them to accept that amendment. State interference would do good in this direction, if rightly directed. They looked for their remedy to a good Employers' Liability Act. Capital had no conscience and no heart. The only way they could get at capital was through its pocket, and it seemed to him that if that Bill was passed, they would be able to do that, and to make it cheaper for employers to take care of the lives of their workmen than to have their places and their public works strewn with corpses, as practically they had been. On the Manchester Ship Canal alone, during the last two or three years of its progress, if they could get reliable statistics of the fatalities and accidents, it would be seen that the number was not less than six to one of any occupation in the world, whether on sea, or on land, or underneath. He based that estimate on the published reports of inquests alone. Last year Mr. Cunninghame Graham tried to get a return, but, unfortunately, the Home Secretary did not seem to think it was worth while giving it, and it did not seem to attract the attention of shareholders and contractors, some of whom were members of the House of Commons.

The President (Mr. T. Burt, M.P.) said that reference had been made to clause 5 of the amended Bill, and in order that they might know what clause 5 was, he would read it:—

"Every action for the recovery of compensation under this Act shall be brought in the County Court, but may, upon the application of either plaintiff or defendant, be removed into the superior court, in like manner and upon the same conditions as an action commenced in the County Court may by law be removed."

It was not for him to offer an opinion or to advise the Congress, but what he wanted to point out was that employer and employed were placed on a basis of absolute equality in the Bill, and that it could only be removed into two superior courts, and he would remind them that recently they had learned the advantage of having an appeal to the highest court; and he need not tell them as to what that case was, because it was before all their minds. Therefore he asked them to bear that in mind, before they decided to limit the right of appeal either to employer or to workman.

Mr. Ward said that they certainly wanted equality, but there was no equality where they had not the right of appeal on the same footing as the employers. He did not suppose there was a single case tried during the last twelve months or two years where the workman had been defeated in the first court that he had been able to appeal to a higher court for a reversal of the decision. Therefore, he said that a workman, in the present state of affairs, was prevented by his poverty from appealing. They wanted to make the Act practical, that the workman should be in the same position as the employer. They were putting forward this subject particularly as it applied to the class of workmen, in spite of the "noes, noes," that were issued forth just now against the mortality of their class in connexion with the Manchester Ship Canal. He himself had seen nine navvies killed in one day on one section of the Manchester Ship Canal. The total mortality on the Canal had risen many weeks last summer to thirteen per week; and although there had been about 500 men killed on the Manchester Ship Canal, until this last question not a single case had obtained compensation during the construction of the whole work. Therefore, they saw the absolutely ridiculous position in which the workmen were placed with regard to the Employers' Liability Bill as it stood at the present time. Certainly he was of opinion that some drastic reform was required in that particular measure. He seconded the proposition.

The motion, amended in the direction suggested by Mr. Hall, was carried almost unanimously.

Enginemen's Qualifications.

Mr. James M. Jack moved the following resolution:—

"That this Congress regrets no favourable opportunity has yet presented itself in Parliament to debate the Bill having for its object the future examination of persons in charge of steam engines or boilers, and the granting of certificates as to their practical fitness for such a duty. That the Parliamentary Committee is herewith instructed to arrange for the reintroduction of this Bill at the earliest possible date; or should any other Bill be introduced relating to steam engines or boilers, that an effort be made to have included the principle of examination, and granting of certificates as to the practical fitness of all persons placed in charge of steam engines or boilers."

He wished to add to the resolution the following:—

"That those in charge of boilers at the time of the passing of this Act, or who have been in charge at any time previous within six months, be entitled to a certificate of fitness without examination at any time for two years after the passing of this Act."

The resolution, he said, had been agreed to for many years, but this year they had instructed the Parliamentary Committee to go a step further, and had made the addition, believing that if it had been in the Bill last session it would have passed. Sir R. Cross, when Home Secretary in 1880, said boilers had a language of their own, and that those in charge ought to clearly understand that language. That was what they were saying there that day. While they asked that there should be an examination of fitness, they did not in any sense say that it would be necessary to bring in Euclid or algebra. All they believed in was that men should have fitness for their occupation.

Mr. W. H. Lambton seconded the motion, which was unanimously agreed to as amended.

Glasgow was chosen as the next place of meeting for the Congress, by 259 votes against 227 in favour of Norwich.

On Saturday there was a large procession of trade unionists through Newcastle, and a "demonstration" consisting of five meetings on the Town Moor.

Illustrations.

A RENAISSANCE PAVILION.

THIS detail is from a design for the Quadrangle of Muncipal Buildings, and represents the principal or entrance pavilion.

The portico is surmounted by a loggia opening from Councillors' retiring room.

The general treatment and ornament is based on French Renaissance work of the François Premier period; the "columnæ cœlatæ" are varied in detail, as also the enrichments of the friezes and panel-treatment of windows.

The statuary, with the exception of the original group in the centre, is from the antique. The group in question is indicative of Administration, with Plenty and Charity on either hand.

The drawing was exhibited at the Royal Academy this year.

WESTERN DOORWAY, CHARTRES CATHEDRAL.

THE western doorway of Chartres, or Porte Royale, a work of the eleventh century, though it attracts least notice at first, is almost the most beautiful in the whole Cathedral. There is a simple directness of expression and a depth of earnest feeling about the sculpture which is lacking in the later work.

The sculptures in the tympanum are, I think, later than the long and somewhat rude figures on the shafts of the jambs—and are done with marvellous delicacy and charm. The subjects are as follow:—In the bottom row above the capitals is the Nativity, with the Virgin lying in a most daintily carved and canopied bed, with the cradle safely placed upon the top. In the second row comes the Presentation in the Temple, where Simeon and the Mother are holding the Child on the altar lest it should fall off. In the angle of the tympanum is the adoration of the Holy Babe seated on His Mother's knee. In the first order of the circumscribing arch are figures emblematic of the Arts and Sciences doing homage to the Saviour; in the second arch are adoring angels with censors. Two spaces in this inner ring are taken up by two of the signs of the Zodiac, for which the sculptor could not find room in the door-arch on the other side. The capitals give a history of the life of our Lord, from the Cradle to the Cross, and are full of the tiniest figures fashioned most perfectly, full of feeling and passion; while between the upright figures on the jambs are shafts carved with representations of the Seasons and their labours. The whole portal is full of the most wonderful fancy, and well repays the closest study.

H. WILSON.

DOORWAY, ST. WULFRAN, ABBEVILLE.

THE tympanum of the doorway at Abbeville is one of those pieces of rich Flamboyant work so common in France, and is, like them, remarkable rather for the wonderful delicacy and richness of the carving than for the passionate portrayal of religious scenes, so characteristic of early work.

H. WILSON.

[Both the foregoing drawings were exhibited at the Royal Academy this year.]

WINDOW, FAIRFORD CHURCH.

THIS illustration of the lower portion of the west window of Fairford Church is from a water-colour drawing by Miss Emma Knight, which was hung in the Architectural Room of the Royal Academy Exhibition of this year, and was a remarkably good example of the rendering of the effect of stained glass in water-colour.

Of the design itself, which, as is well-known, is ascribed to Albert Dürer, it is only necessary to observe here that it represents the Mediæval conception of the Last Judgment. In the centre light is an archangel with a sword, representing perhaps Divine Justice, beneath whose feet the dead arise; in the three lights on the

left is seen the reception of the blessed into Heaven, in those on the right the wicked are carried away and tortured by evil spirits, who are represented with that force of grotesque horror which is often found in the treatment of subjects of this kind in Mediæval art. There is something reminding one of Dante in the idea of the crouching being, with the vast grinning head, which is squatted at the foot of the right-hand light, and represents no doubt the central or presiding demon, the Devil *par excellence*, as he is also represented by Dante as the last horror at the lowest circle of Hell.

Much as this window has been talked of, there are not many illustrations of it accessible, and this monochrome reproduction from an exceptionally careful drawing may therefore be of interest.

SOUTH KENSINGTON MUSEUM COMPETITION:

MESSRS. DEANE & SON'S DESIGN.

LAST week we gave as one of our illustrations an interior view of the Central Hall of the design submitted by Messrs. Sir T. N. Deane & Son, of Dublin. Since we went to press with our last week's number we have received from Messrs. Deane & Son the following description of their design:—

"The façades of this design are in a Spanish Renaissance style, in which the arrangement of the front of the Certosa at Pavia has been followed, chiefly in the treatment of the ground-floor windows and the *mezzanine* story. This latter feature was introduced with a special object, namely, to get high wall space below the windows on the first-floor, the *mezzanine* arcade being only a triforium on the outside. Towers were avoided as being useless, and the architects were led to understand that they were not wanted, South Kensington being already over-towered; reliance was placed on continuity of line and the dignity gained by simplicity of composition. It was also considered necessary to continue to some extent the lines of the Science Schools.

Internally, there was a little more opportunity for freedom, and the architects adopted a more Gothic treatment, but with Renaissance detail predominating. This may be seen in the cloister-courts, and in the design for the entrance-hall which was published in the *Builder* last week, in which, in the architects' opinion, there is more sympathy, so to speak, owing to its Gothic feeling. Indeed, there is little doubt that the more Gothic a building is the more it pleases.*

Messrs. Deane consider they were rather handicapped by the restriction which allowed window and door openings only to be tinted; there were colonnades or loggias and recesses which were of as much or more importance to the design, and which, if tinted, would have given the relief so much required; but as this was not permissible, it was decided to use no tinting at all, as it was impossible to draw the line between what was allowed and what was not, without making the design look ridiculous; the consequence was the drawings looked flat, and caused the design to be criticised as 'wanting relief.'"

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—The members of the Northern Architectural Association held their third visit of the summer session at South Shields on Saturday last, when a very large and unexpected variety of work was brought before their notice. A goodly company of members assembled, and, under the guidance of Mr. Joseph H. Morton, F.R.I.B.A., visited the following works:—The Theatre Royal, which has just been redecorated and remodelled; the new Board Schools in Westoe-lane; St. Michael's and St. Aidan's Churches; the new Park on the Lawe; the Wouldhave Memorial; the new swimming-baths; and the assembly-hall in connexion with the Royal Hotel. During the visit, a steam-launch was placed at the disposal of the members, who took advantage of it to run out to sea to inspect the piers, the southern one being just completed. On the invitation of the Vice-President, Mr. Morton, the members partook of tea at the Royal Hotel.

* We are not, of course, responsible for the opinions here expressed.—ED.

MORTALITY IN RELATION TO OCCUPATION.*

OF all the various influences that tend to produce differences of mortality in the different parts of a given country, there is none so potent as the character of the prevailing occupations.

Favourable or unfavourable climatic and geographical conditions, activity or inactivity on the part of the sanitary authorities to provide wholesome water, to remove filth, and to prevent overcrowding, contribute, doubtlessly, in no small measure to reduce the death-rate in one town or to raise it in another; but all differences, so produced, are comparatively insignificant, when compared with the differences shown by the death-rates in different industries.

There are some occupations of so deadly a character, that life insurance companies will have nothing to say to them, refusing to insure the life of a man engaged in them on any terms whatsoever, while, on the other hand, there are professions, or at any rate, there is one profession, in which the chances of longevity are so high, that an insurance company which is lucky enough to number a considerable proportion of those so engaged among its clients, advertises the fact to show the general public upon what a safe basis its business is founded.

The comparative mortality of the persons employed in different industrial occupations is, then, a subject than which none more appropriate could be found for discussion in a Congress of Hygiene and Demography. Nor could any more appropriate place be found for its discussion than the country in which we are now assembled. For, in the first place, there is no country in which the number of occupations is greater, probably none in which it is so great, as England, with its numerous and varied manufactures.

It fell to my lot some years ago to have to construct for official purposes an alphabetical index of all the various occupations in which persons are engaged in England and Wales. I issued circulars, asking for information, to manufacturers of all kinds; and searched through the trade directories of the chief industrial towns, and by these means, together with the old census documents, I collected no less than 12,000 different names of occupations; and, even when all allowance is made for some of these names being duplicates for one and the same occupation, the remaining number will still be enormous.

Secondly, not only are the occupations thus numerous, but they are grouped in the census returns of the United Kingdom under a much larger number of distinct headings than is the case in the census of any other country; and, thirdly, the persons in any given occupation group are subdivided in our census returns, not merely by sex, but also by their ages to an extent not to be found elsewhere, unless, indeed, it be in Switzerland.

The sub-division by ages is of the very highest importance. Even for other purposes a tabulation of the population by their occupations can be of but very inferior value, if no account be given of the age-distribution of the persons in each group; but for calculations of mortality such particulars are absolutely necessary. For the differences in the age, distribution of the persons employed in different industries and professions are so great, that the comparison of the crude death-rates,—that is, of the death-rates calculated on the aggregate persons employed, without correction for differences of age-distribution,—would often lead to most serious errors.

The only method of making death-rates that can be safely compared with each other is the laborious plan of calculating the death-rates for each occupation at each separate successive age-period, and then applying these successive death-rates to a population with precisely the same age-distribution in each industry.

This method, indeed, is necessary, not only when the mortality of an occupation is being compared with that of any other, but generally in all comparisons of mortality, as for instance, in comparison between the mortalities of different countries, or between the mortalities of the two sexes. It is, however, a method which, owing to its laboriousness, is rarely used, with the necessary consequence that many very erroneous comparisons are made.

The figures which I shall now give as to the mortality in different industries and professions were derived from a comparison between the census returns for 1881 and the death registers for the three years 1880-1-2.

They relate exclusively to males; for the returns made by the other sex, both of their occupations and their ages, are not sufficiently accurate to give a basis for calculation.

The figures, moreover, relate only to males between 25 and 65 years of age, for several reasons which it is unnecessary now to discuss, but mainly because these forty years of life are those in which, speaking generally, the influence of occupation is most marked.

The figures have been derived from the death-rates in each occupational group, one the death-rate of men between 25 and 45, the other the death-rate of men between 45 and 65, and these rates have been in each case applied to a male population in which those under and those over 45 bore a certain fixed proportion to each other.

Of the death-rates thus obtained, the lowest was that of men in the clerical profession, and for the sake of easy comparison I have taken this lowest death-rate as my standard. I represent it by 100, and the death-rate of each other profession or industry is represented by a figure duly proportionate to this standard.

TABLE A.—*Comparative Mortality of Men, 25 to 65 Years of Age, in different Occupations*, 1881-2-3.

Clergymen, priests, ministers	100	Carpenters, joiners	148
Lawyers	152	Cabinet-makers, upholsterers	173
Medical men	202	Plumbers, painters, glaziers	216
Gardeners	108	Blacksmiths	175
Farmers	114	Engine, machine, boiler makers	155
Agricultural labourers	126	Silk manufacture	152
Fishermen	143	Wool, worsted, manufacture	186
Commercial clerks	179	Cotton manufacture	196
Commercial travellers	171	Cutlers, scissor makers	229
Innkeepers, liquor dealers	274	Gunsmiths	186
Inn, hotel service	397	File makers	300
Brewers	245	Paper makers	129
Butchers	211	Glass workers	214
Bakers	172	Earthenware makers	314
Corn millers	172	Coal miners	160
Grocers	139	Cornish miners	331
Drapers	159	Stone, slate, quarries	202
Shopkeepers generally	158	Cab, omnibus service	267
Tailors	189	Railway, road, labourers	185
Shoemakers	166	Costermongers, hawkers, street sellers	308
Hatters	192		
Printers	193		
Bookbinders	210		
Builders, masons, bricklayers	174		

Time will not allow me to enter into any detailed examination of these figures; but you will notice how enormous are the differences of mortality in the different industries included in the list, the mortality figure being three or more times as high in some cases as it is in others. The mortality of clergymen, for instance, being represented by 100, that of men engaged in the earthenware manufacture is represented by 314, and that of inn and hotel servants by no lower a number than 397.

Now, to what causes are these striking contrasts due? Why is one occupation more unhealthy than another?

The causes of high mortality may, I think, be conveniently classed under seven general headings.

1. Firstly, there is working in a cramped or constrained attitude, and notably in such an attitude as cramps the chest and interferes with the action of the heart and lungs.

This cause to a certain extent may be said to affect all persons who are habitually engaged in sedentary occupations. But there are some trades which are more specially affected by it; and Dr. Greenhow instances the "silk weavers of Macclesfield, the lace makers of Buckinghamshire, and the glovers of Yeovil; in the first of which three classes the mischief is caused by pressure of the chest against the breast-beam of the loom, preventing the due expansion of the lungs; while in the other two classes the same evil is produced by contraction of the chest, induced by habitual stooping over their work." Possibly some share in producing the somewhat high mortality of shoemakers, as shown in the table, may be ascribed to this same cause, namely, the bent and stooping attitude in which they work and the pressure of the last against the pit of the stomach.

2. The second cause is exposure to the action of special poisonous or irritating substances, such as phosphorus, mercury, lead, infected hair or wool, soot, &c.

As examples of this, I may enumerate the jaw disease that attacks the dippers of lucifer-matches; the mercurial tremor and ulceration

* From a paper by William Ogle, M.D., F.R.C.P., read in Division II., Demography, of the recent Congress of Hygiene and Demography.

of the fauces that attacks water gilders, hatters, furriers, and others that make use of quicksilver; the arsenical poisoning of paperhangers, pigment makers, and those who manufacture artificial flowers; the cancer of chimney-sweeps; the anthrax of woolsorters; and the so-called "brassfounders' ague" of workers in copper or zinc; and, lastly, the various diseases that assail those who work in lead.

It is this last poison that, in this country at any rate, is of the most interest, because of the comparatively large number of industries in which the workman is brought into contact with the metal. It is this which, in combination with a more than average liability to accidents, causes the high mortality of painters, plumbers, and glaziers, as shown in the table; and that in combination with the inhalation of metallic dust raises the death-rate of file-makers, who use a cushion of lead on which to strike the files, to so enormous a figure. This same poison contributes to the mortality of earthenware-makers, of gasfitters, of printers, and other workers that need not be here enumerated. The chief sufferers, however, appear to be the painters and glaziers and the file-makers. For, judging from such scanty data as could be extracted from four years' (1879-82) death registers, I found that the annual mortality from lead-poisoning among males over fifteen years of age, was as follows:—

File-makers	466	per million living.
Painters, plumbers, glaziers	224	,, ,,
Earthenware-makers	152	,, ,,
Gasfitters	62	,, ,,
Printers	27	,, ,,
All other males	4	,, ,,

I need hardly say that the deaths directly ascribed to lead-poisoning, on which the above rates are based, by no means fully represent the amount of mortality caused by that poison. Lead affects injuriously all the organs of the body, and notably the kidneys, as well as the nervous and the muscular tissues.

Thus of all industries into whose mortality I have inquired, the two in which the mortality from urinary diseases was the highest were the file-makers and the painters and plumbers, the mortality under this heading being three times as high as the average among the former, and more than twice as high among the latter.

3. The third cause of high mortality is excessive work, mental or physical. As to excessive brain-work, I need say nothing. We all know how such work, especially if of a harassing character, leads to disease of the nervous system, brain softening, insanity, and suicide, this last especially being much more frequent, speaking generally, among the educated classes who use their brains than among the uneducated labourers.

As regards excessive bodily labour, we must make a distinction, according as the labour is merely severe because of its long continuance, or is such as subjects the worker to violent muscular efforts and consequent strains. The former, or merely long-continued hard work, does not seem nearly so injurious as is often supposed. At any rate, neither agricultural labourers nor miners seem to suffer from it; for in each the mortality is very low, the agricultural labourers being indeed one of the groups with the lowest mortality figure.

But as regards men subjected to sudden strains the case is different. Porters and dock labourers, for instance, are notoriously liable to hernia, and it has recently been stated that the latter rarely escape that affection. I am unable to give any precise statistics as to this matter. There is, however, one industry in the table, in which I cannot but think that the effects of violent and sudden exertion are visible. I refer to fishermen. Fishermen are with miners and quarrymen more liable to fatal accident than any other set of men; they live, moreover, a life of exposure to all kinds of rough weather. Nevertheless, their death-rate is extremely low, the mortality figure as given in the table being only 143, and one of the lowest.

But there is one group of diseases to which I was surprised to find that, so far as could be inferred from the records of those years, fishermen, otherwise so healthy, appeared to be liable in a far more than average degree,—namely, diseases of the heart and organs of circulation.

Possibly the cold and wet to which the fisherman is exposed, and the consequent rheumatic affections, may have some share in this, and perhaps also the frequent and prolonged periods of anxiety that beset his life of peril; but I cannot but suspect that the main cause is to be found in the sudden muscular strains and violent efforts to which his occupation subjects him.

4. Fourthly, I come to working confined and in foul air. This is probably, in the aggregate, one of the most destructive agencies in operation, because of the very large number of trades that are exposed to it.

The difference between an out-of-doors life in fresh country air and an indoor life in a town is readily shown by comparing the mortality of farmers, agricultural labourers, gardeners, and fishermen with that of shopkeepers; or, going a step further in the scale of vitiated atmosphere, with the mortality of tailors, printers, bookbinders, and hatters, all of whom habitually work in over-heated and under-ventilated rooms.

The damage done by working under such conditions is not confined to one set of organs, but nevertheless specially affects the lung respiration, and, therefore, in the following short table I have confined myself to phthisis and diseases of the organs of respiration. I have taken fishermen, who suffer least from this disease, as my standard, and represented their mortality as 100.

TABLE B. — *Comparative mortality from Phthisis and Lung Diseases of men* (45-65 *years*) *working in pure and vitiated air.*

Air.	Occupation.	Phthisis.	Diseases of Respiratory Organs.	Phthisis and Diseases of the Respiratory Organs.
Pure	Fisherman	55	45	100
	Farmers	52	50	102
	Gardeners	61	56	117
	Agricultural Labourers	62	79	141
Confined air	Grocers	84	59	143
	Drapers	152	65	217
Highly vitiated air	Tailors	144	94	238
	Printers	233	84	317

5. The fifth cause of the vast differences of mortality is one which differs from the rest in that it is in the option of the individual workman to steer completely clear of it, if he so wills: I refer to drink. No man, whatever his trade, need drink more than is good for him, unless he pleases. Still there are, doubtlessly, trades in which the temptation to do so is so great that practically constant exposure to drink comes to be very much the same thing as constant exposure to such unavoidable poisons as mercury, lead, or phosphorus. . . . .

6. The sixth cause of the contrast between different industries is to be found in the differences they present as regards liability to fatal accident. There are three occupations among those in my list which are pre-eminently liable to fatal accident, namely, mining, stone and slate quarrying, and sea-fishing. If we represent the deaths by accident of all males, of from twenty-five to sixty-five years of age, by 100, the mortality from the same cause for miners, so far as our death-registers enable us to calculate, will stand at 269; that of stone and slate quarrymen at 222; and that of fishermen at 226; this last-given figure being doubtlessly somewhat below the truth, because the deaths of some fishermen, who are drowned, and whose bodies are not recovered, escape registration.

Next to these, but far behind, among such occupations as have been examined by me, come men engaged in cab and omnibus service, and painters and glaziers, these latter being specially exposed to danger of falling from scaffolding or other height.

7. The seventh and last cause of high mortality is exposure to inhalation of dust. The effect of this, speaking generally, is, of course, to increase the mortality from phthisis and from diseases of the lungs; but the effect differs very greatly, not only according to the amount, but also according to the character of the dust, that which consists of hard and sharp-pointed particles naturally being more irritating to the air-passages than that of which the particles are soft or rounded.

TABLE D.—*Comparative Mortality from Phthisis and Respiratory Diseases of Men in various Dust-inhaling Occupations.*

Men from 25 to 65 Years of age.	Phthisis.	Lung Diseases.	Phthisis and Lung Diseases.
Fishermen (as Standard).	55	45	100
Carpenters, joiners	103	67	170
Bakers	107	94	201
Wool-workers	130	104	234
Cotton-workers	137	137	274
Cutlers, scissors makers	187	196	383
File makers	219	177	396
Masons, bricklayers	127	102	229
Stone and slate quarrymen	156	138	294
Pottery makers	239	326	565
Cornish miners	348	231	579
Coal-miners	64	102	166

Thus the dust of the ordinary kinds of wood, such as are commonly used by carpenters and joiners, appear to have very little, if any, baneful effect upon the air-passages, for the mortality of these artisans, both from phthisis and from diseases of the respiratory organs, is below the average for males generally.

The harder kinds of wood, however, such as are used by cabinet-makers, are said to give off a much more injurious dust than do the softer woods used by carpenters; and that this is so is not only probable *à priori*, but is supported by such scanty statistical evidence as I can adduce. For though I am unable to give the mortality of cabinet-makers from phthisis and respiratory diseases by themselves, their mortality from all causes together is considerably higher than that of carpenters, the mortality figure in Table A for these latter being 148, while that of cabinet-makers and men generally in the upholstering business is 173. The dust of flour, again, of which millers, bakers, and confectioners necessarily inspire large quantities, appears to have no injurious effect upon their vitality. It is, indeed, very doubtful whether much of this flour-dust reaches the lungs, and is not arrested on the way by inter-mixture with the saliva, and by adherence to the moist surface of the tongue and pharynx. At any rate, the mortality of bakers and confectioners from phthisis is scarcely above that of carpenters and joiners, and though their mortality from diseases of the respiratory organs considerably exceeds that of the other group of workers, this is probably not due to any irritation from the flour-dust, but to the heated atmosphere of the bakehouse, which contrasts strongly with the fresh out-of-doors air in which carpenters and joiners habitually work.

More injurious than either wood-dust or flour-dust appear to be the filaments and fluff and other dusts that are given off in textile factories; the mortality from phthisis, and from diseases of the respiratory organs, being much higher among workers in cotton and wool than among carpenters or bakers. The amount of dust given off in the cotton factories is much greater than that given off in most of the processes in the wool factories, owing to the wool being treated with oil; and, in both cotton and wool factories, far exceeds that given off in silk mills, where dust is studiously avoided as injurious to the costly material.

Moreover, the dust in the cotton factories is not only more abundant, but is also of a more irritating character; for it consists not merely of filamentous matter, but contains a considerable intermixture of the mineral substances that are used in sizing, and mineral substances, as will be presently seen, are specially injurious to the lungs.

There are doubtlessly in addition to the dust other causes in operation in those factories, or at any rate in the cotton and the wool factories, that tend to produce disease, and notably the higher temperature of the weaving sheds. In this respect, again, the cotton factories are the worst off, the temperature in their sheds having been described in an official report as "tropical and relaxing." It is in accordance with these differences, that while the mortality from all causes of men in the silk factories is represented by 152, in the woollen factories it is represented by 186, and in the cotton factories by 196 (Table A).

As to the separate mortality from phthisis, a disease of the respiratory system, I can give you no figures so far as concerns the silk mills; but in the wool factories the mortality, as is

shown in Table D, is represented by 234, much higher than that of the carpenters and the bakers before dealt with, while that in the cotton factories is represented by 274.

Let us now pass on to those industries where the workman is exposed to the inhalation of mineral dust.

There are two industries given in the table in which the workman is specially exposed to the inhalations of metallic dust, namely, the manufacture of cutlery and file-making. In the former, the mortality from phthisis and diseases of the respiratory system stands at 383, and in the latter at 396; and doubtlessly had not such subsidiary operations as hafting been included in the cutlery manufacture, the mortality figure would have been still higher. Even as it is, it is nearly four times as high as that of fishermen, who work in an atmosphere perfectly free from dust.

Indeed, the mortality of cutlers and of file-makers from the diseases alone is almost as great as that of fishermen from all causes put together, including accident, to which, as we know, fishermen are specially liable.

Still more formidable in its effects upon the air passages appears to be the dust of stone. There are, in the table, four industries thus affected, namely, masons and bricklayers, stone and slate quarrymen, Cornish miners, and pottery makers. In all of these the mortality, both from phthisis and from lung diseases, is very high, but there are notable differences between them. Two of the four, the masons and the quarrymen, work in the open air, and their mortality from these diseases is only from two to three times that of fishermen, which is taken in the table as the standard; but the other two, the Cornish miners and the potters, work in more confined space, and consequently inhale the stone-dust in much larger amount, and for them the mortality from phthisis and lung disease is from five to six times as high as that of fishermen. I should rather say *was* five or six times as high; for I am informed that in the ten years which have elapsed since the data on which my table is constructed were collected much improvement has been made under the Factories and Workshops Act in the conditions under which potters carry on their work, and that a fresh collection of data, such as I hope to make when the present census shall have been completed, will show a large diminution in the mortality of this industry.

There remains yet one industry among those exposed to inhalation of dust of which I have not yet said anything—I mean coal-mining. This I have reserved to the last, as requiring special consideration. Seeing the conditions under which coal-miners work, in a hot and dust-laden atmosphere, and their terrible liability to fatal accident, it might naturally be expected that their death-rate would be excessively high. As a matter of fact, this is far from being the case. Even when fatal accident is included, their death-rate is by no means an excessively high one; and, putting accident aside, the death-rate from disease alone is exceptionally low, being almost exactly the same as that of agricultural labourers.

Limiting ourselves, however, only to phthisis and diseases of the respiratory organs, which are the affections to which coal-miners are popularly supposed to be especially victims, we have the figures given in the last table (D); and it will be seen that, though the mortality of coal-miners from respiratory diseases is somewhat high, it is by no means excessively so, and that their mortality from phthisis is far below that of other dust-inhaling occupations, and, indeed, it is not very much above that of agriculturists, or even above that of fishermen, who enjoy all the advantages of a dust-free atmosphere.

This seems so strange that one would suspect that the figures given in the table must be for some reason erroneous, perhaps from being based on too scanty a collection of data; but that it is not so may be inferred from the fact that a similar conclusion as to the comparative immunity of coal-miners from phthisis has been arrived at by, I believe, all other, and, at any rate, by many other, persons both in this country and abroad who have investigated the subject.

Now, that coal-dust should be less injurious to the lungs than the dust of stone or metal is readily intelligible; for, as Hirt has pointed out, the particles of coal when examined under the microscope are found to be, comparatively speaking, rounded off and free from sharp points and angles such as characterise the flint-dust in a china factory.

This, however, clearly would only explain why coal-miners are less subject to these diseases than workers in metal and stone, and not why they are scarcely more subject to them, taken together, than agricultural labourers, nor why their mortality from phthisis alone is very little above that of fishermen, who have been taken as the standard of comparison, because of their great healthiness.

The figures given in my table, supported as they are by the consentient evidence of all those who have personal experience of the diseases of miners, leave no possible doubt that for some reason or other coal-miners are much less liable to phthisis than most other workmen, and that, even as regards lung disease generally, their liability is by no means so great as is usually supposed.

The question is, To what is this comparative exemption due? There are two possible explanations: one, that the apparent exemption is simply due to the picked character of the miners, inasmuch as none but strong men are likely to adopt so laborious a calling; the other, that there is some special preservative condition attaching to the industry; and, as the most notable of the conditions under which the coal-miner works is the necessary inhalation of coal-dust, it is to this that most writers who have adopted the second explanation attribute the comparative immunity. "It is in the highest degree probable," says Dr. Hirt, in his well-known treatise, "that coal-dust possesses the property of hindering the development of tuberculosis, and of arresting its progress."

The exigencies of time prevent me from entering into discussion of the arguments for and against each of the two possible explanations. This much, however, I may say, that though a careful weighing of them has left me in doubt as to the side to which the balance inclines, a sufficient amount, at any rate, of probability attaches to the opinion expressed by Hirt to make it worth the while—I would indeed say, to make it the duty—of pathologists and scientific medical men generally to examine carefully into the question to determine whether the opinion be really true, and, if it be, to ascertain what this preservative substance is, and whether it may not be such as is capable of being applied to others than those who work in the depths of the coal-pits.

Correspondence.

To the Editor of THE BUILDER.

THE EIGHT HOURS' MOVEMENT.

SIR,—An inquiry has been made by a correspondent of the *Times* as to what is meant by eight hours a day as regards the engineering and allied trades. I should like to make a similar inquiry as to the building trades, which seem likely to come to a standstill in London.

The master builders want to work fifty-two hours a week in summer and forty-seven hours in winter. This would total up to 2,540 hours in the year. If for two or three weeks only it should be impossible to work, from frost, &c., the hours would be reduced to 2,400 hours per annum, which is exactly eight hours per day for the 300 working days in the year. If these hours are to be reduced by 11 per cent., it is manifest that the cost of building must be increased considerably. The rent, rates, and taxes of all workshops, the plant, machinery, and capital of the masters must be less productive, and, in consequence, the amount of work that the public can afford will be limited. The wages of an ordinary building mechanic are now in London very nearly 2*l.* per week. T.

"RUSHES AS A KEY FOR PLASTERING."

SIR,—In reply to your correspondent (p. 194 *ante*), rushes were used in the West of England as late as fifty years ago. They were somewhat similar to the bulrush, cut and dried in the summer, made up in bundles, and used by plasterers in cottages and other places as a cheap material, and fixed to joists, as described. DAVID LODER.

Richmond.

SIR,—Referring to Mr. Henry Lovegrove's letter of the 5th inst. (page 194 of the *Builder*), reeds,—not rushes,—were used fifty years ago, to my knowledge, in place of fir laths. They were used for cheapness, there being very few fir laths obtainable then in my part of the country,—viz., Huntingdonshire; the laths most used being oak sap laths,—best heart of oak,—for plain tile roofs and outsides of houses for rough casting work.

These reeds grow in the Fen districts, and I have known people go as far as twenty miles for them; there was also a kind of grass, called sedge grass, used for thatching the roofs of cottages obtained from the Cambridge Fens.

London. BENJ. CORBETT.

PNEUMATIC CARTS FOR EMPTYING CESSPOOLS.

SIR,—I am seeking information about the pneumatic carts as used in Burgundy and elsewhere for emptying impervious cesspools.

Can any of your readers give me or direct me to any information on the subject? C. F. M.

STABLE DRAINAGE.

SIR,—It may be of interest to a few of the squabblers for precedence in the reform of stable drainage that some forty years ago, as nearly as I can remember, I had a letter from Sir Henry Dryden, one of the most practical men of his age, warning me against the new idea of underground drains for stables, and insisting not merely on their being above ground, but on their being made clear open channels, which could not smell and become clogged. He had first of all, on good recommendation, taken up the old channels and laid his own stable drains underground; and then, after a short experience of the result, he had recurred to the old system, and necessarily at considerable expense.

Practically the open pipe plan is almost as bad as below ground. The channels do not get cleaned out as they ought to be, and the confined and stagnant air becomes for hours together charged with the evaporation from the decomposing matter.

Then, to make matters worse, the groom, who has charge of highly nurtured horses, invariably dreads a full supply of fresh air, lest they should get chilled. He is not sufficiently conscious of the fact that an abundance of fresh air, even regardless of its temperature, is the only way to keep the "vet." from the stable door.

WILLIAM WHITE, F.S.A.

SIR,—Relative to Mr. Elliot's letter in the *Builder* of last week [p. 214], I am aware that open surface-drains, as advocated by Sir F. Fitzwygram, discharging outside the stables, are to be commended, and, further, that the same authority condemns iron gutters, substituting open concrete channels as laid for him with excellent results by Wilkinson & Co. at many barracks during the last fifteen years or more, all this being contrary to that which is to be inferred from your correspondent's letter.

In private and other stables where good iron fittings are used and appearance is an object, his system is not so practicable, as the paving must either fall to the outlet, so as to have an equal depth of channel throughout, or the fall must be in the channel itself. Under the former conditions, the levels of the bases of the iron stall-posts, and also the level line around the stable, would be destroyed; or, under the alternative conditions above stated, at the outlet the channel is at a dangerous depth,—a somewhat difficult problem to solve. If the wall is perforated with a simple hole for the purpose of carrying the channel outside, the stableman promptly stops it up with straw to exclude draught. To obviate this I have carried a lead pipe through the wall with a hinged flap, and I have tried other schemes to overcome the difficulty, with qualified success.

After considerable experience I regard pots in a stable as the less evil, as by their use the adjustment of the levels—so important to the horses—is more under control.

If the liquid is allowed to run direct into the intercepter, as in my system (and not, as at present, to remain and generate ammonia), and the underground drains have a sufficient fall, I assert, with confidence, that this system is free from any demerits, sanitary or otherwise.

If covered channels are imperative, I form them in concrete, and provide suitable iron covers, any falls to the pots being worked in the cement. Stablemen, however, prefer covered channels, inasmuch as the covers conceal the refuse, and make inspection difficult. I trust that your correspondents will now understand the marked difference between my system and theirs.

A. J. B. WARD.

Great George-street, Westminster.

SIR,—We note Mr. Ward's letter in your last issue. We regret that there should be any misunderstanding on either side, but his description seemed to embrace our pattern gutter and outside gulley. However, it appears now that Mr. Ward does not claim an iron gutter at all, and we do not know what his outside trap is without seeing a section.

Of course, it is common knowledge that either the floor or the drain must slope; in the first case, when the floor is sloped, the gutter, whether in iron or concrete, can be practically the same section throughout. In the second case, when the floor is level, the drain must get deeper and deeper, to give the fall. This, we think, is difficult to accomplish in concrete for any length, consequently, we have introduced an iron gutter which has a fall in

itself, and varies in depth from 2 in. up to 9 in., or more, and we maintain that we were the first to introduce such an iron gutter of continuously varying depth, which is specially designed with no internal angles where matter can lodge and become offensive.

COTTAM & WILLMORE.

Winsley-street, Oxford-street.

"A DEATH-TRAP."

SIR,—In my communication in your last (p. 214 *ante*) I wrote, by a slip of the pen, "the north and south aisle doors of west entrance of St. Albans Abbey are each 3 ft. 9 in. wide." This should be "4 ft. 9 in." It is as well to correct this detail for the sake of accuracy, though it does not affect the main point.

RESIDENT.

The Student's Column.

MARBLES—XII.

THE mineral felspar, influencing as it does the colour of many ornamental stones, is important enough to warrant our giving some detailed account in that connexion. There are several kinds of felspar, but we shall select for description those only which more particularly enter into the composition of porphyries and similar polished stones. The colour of a rock frequently depends upon its felspathic constituent. If the felspar be clear, transparent, and glassy, the light enters it and is absorbed, giving to the stone a dark colour, as in the case of certain granites, and many quartz-porphyries and diabases. If the felspar is soft and porous, the light is reflected from the surface, and the rock appears white. In all the pink and red granites and gneisses the colour is due to the pink and red orthoclase they contain. It sometimes happens* that the orthoclase and plagioclase,—when both are present in the same rock,—are differently coloured, the orthoclase being pink or red, whilst the plagioclase is nearly white. The felspars possess a distinct cleavage—that is, they split or cleave in one or two directions much more readily than in others. It therefore sometimes happens, especially in coarse-grained and porphyritic rocks, that it is very difficult to obtain the perfect surface necessary for polishing, since little particles of the felspars are constantly splitting out, leaving small cavities.

ORTHOCLASE FELSPAR.—Chemical composition: silicate of alumina and potash; part of the potash is often replaced by soda, magnesia, or lime; the alumina by sesquioxides of iron and manganese. It is very variable in colour, but white, red, and flesh-colour are the most common, whilst various shades of grey and greenish-grey are the rarer tints. The mineral may be either semi-transparent or opaque. Orthoclase is generally associated with quartz, and often with hornblende, whilst the felspars less rich in silica more rarely accompany free quartz, It may occur as crystals, in compact masses, in veins, and sometimes in drusy cavities; and is common in a large number of ornamental stones.

OLIGOCLASE FELSPAR.—Chemically composed of silicate of alumina and soda, the latter often replaced by more or less potash and lime, and minute quantities of the protoxides of iron and manganese. This soda-lime felspar contains, in good specimens, about 63 per cent. of silica, 4·2 of lime, 8·4 of soda, and the remainder alumina. The proportion of silica is generally below this in specimens containing a larger quantity of lime than indicated, but it increases in proportion as there is more soda. It is grey, green, yellow, white, and occasionally has a reddish tinge. Oligoclase is a common constituent of porphyry, syenite, and many other rocks used for ornamental purposes; and occurs mostly in well-developed crystals, partly in irregular crystalline grains, and sometimes as a crystalline paste or base in which the other crystals of the rock are imbedded.

LABRADOR FELSPAR.—Chemical composition, silicate of alumina, lime, and soda; silica, 52 9; alumina, 30 3; lime, 12·3; and soda, 4 5. Pure Labradorite has no soda; the analysis given is that which usually obtains. The common colour is ash or greenish-grey; but it is frequently of various shades of green, yellow, and red, and sometimes the smaller crystals are colourless. A marble possessing much of this mineral is usually exceedingly handsome, as Labradorite has a magnificent vitreous lustre, inclining to pearly on the most perfect cleavages, and sub-resinous on other surfaces. It is translucent, especially at the edges. In the typical labrador-rock of North America, and elsewhere, it is characterised by its brilliant iridescent tints and striated appearance, due to the hemitropic arrangement of the crystalline plates composing the mass. It occurs in many porphyries. Professor Winchell has described* a remarkable ornamental gabbro from near Duluth, Minn., which has Labradorite in crystals one-half to three-fourths of an inch across, and occurs to the almost entire exclusion of other constituents. In this form the colour of the rock varies from lavender-blue or bluish-grey to light green, and acquires a beautiful surface and polish, being considered a very valuable material for ornamental slabs and columns. Labradorite is also found in porphyries of the Vosges, in Scotland, and elsewhere.

Of the numerous other felspars we will only mention anorthite and albite. The former is a silicate of lime and alumina, having a large proportion of lime (20 per cent.), but which is often replaced by magnesia, potash, and soda, to the extent of 5 per cent. It is white, or milky white, and occurs principally in diorites and lavas. Albite felspar is a silicate of alumina and soda, the latter being often partly replaced by potash, lime, or magnesia. It commonly differs from orthoclase, amongst other things, in that the soda is more abundant than the potash. It is white, sometimes with pale-blue, grey, red, or green tints. Its lustre is generally vitreous, but pearly on the cleavage faces. Albite is found in porphyries, diorites, &c., but is not so abundant as orthoclase.

We cannot close our remarks on the composition and colours of the felspar group of minerals without calling the student's attention to the importance of appreciating the meaning of the foregoing remarks. In subsequent articles, dealing with the weathering of various kinds of marble, we shall frequently have occasion to allude to the felspars, when the student will miss much that is of interest unless he bears in mind their chemical composition and other peculiar characteristics.

MICA.—This mineral, although playing an important part in the constitution of granites and sandstones, does not often occur in marbles. We may mention, however, that there are two principal varieties of mica, one of which is black (biotite), and the other light bronze or white (muscovite). Both of these receive a polish only with difficulty, and even that polish disappears as the stone becomes slightly weathered. From the marked contrast in colour of the two micas, it follows that they have a decided influence upon the tint of the rock containing them.

CALCITE.—This is the commonest mineral in true marbles, as we have before remarked. In chemical composition it is carbonate of lime; lime 56, carbonic acid 44 per cent. When pure it is generally transparent, translucent, and colourless, as in statuary marble; but it is more frequently tinged with various shades of grey, blue, green, red, yellow, brown, and black, owing to the presence of mechanical or chemical impurities. It occurs in marbles in a crystalline form, either as an original constituent of the rock, or as veins running through it. The majority of the organic remains in marbles of aqueous origin are of calcite; and the mineral takes a beautiful polish when crystalline and not decomposed.

ARAGONITE.—The chemical composition of this mineral is identical with that of calcite (viz., carbonate of lime), but the two minerals differ in crystalline form, in molecular structure, and to a greater or less degree in their physical and chemical properties. Aragonite is harder and heavier than calcite, but, nevertheless, is not so durable. Pure aragonite is white, but, like calcite, it takes various colours, imparted to it by divers substances. These latter impurities are usually carbonates, especially of strontia, lead, &c. Unlike calcite, aragonite very rarely constitutes rock masses, but occurs in beds containing altered gypsum, and in numerous marbles which are mainly lime compounds, such as serpentine, fresh-water limestone, &c. Aragonite is sometimes found, however, in deposits of sufficient extent to be quarried as marble. The beautiful "onyx marble" of San Luis Obispo is nearly pure aragonite.

IRON PYRITES.—Chemical composition: iron disulphide; sulphur 53·33, iron 46·67. The colour of this mineral is brass yellow, and by superficial alteration it becomes brown; its metallic lustre renders it very conspicuous. Although it is very liable to weather, the possession of this mineral by marbles is regarded as a valuable feature, as it very much resembles gold in appearance. The majority of marbles in which "gold" is said to be conspicuous frequently contain no pyrites, the "gold" being merely a golden-yellow tint, the product of one or other of the various chemical compounds already mentioned.

MARCASITE.—This mineral is not unlike iron pyrites, having the same chemical composition, but it weathers more readily and crystallises in very different forms. Its colour is pale bronze-yellow, sometimes green, or metallic white, brownish, or iridescent.

Other minerals commonly found in marbles are magnetite, which has a brown or white metallic hue; and olivine, which is green, and is often altered into serpentine.

* "Smithsonian Report," 1886, pt. II., p. 295.

* "Geology of Minnesota," vol. . pp. 148-9.

GENERAL BUILDING NEWS.

GRAMMAR SCHOOL, STRATFORD-ON-AVON.—Mr. A. S. Flower, architect, has surveyed the old King Edward Sixth Grammar School buildings with the view of their being repaired as far as necessary and made more structurally fit for their use than at present. The following extract from his report is of interest: "The buildings occupied by the school are of much greater antiquity than is apparent from a cursory inspection of their exterior, especially as regards their principal front towards Church-street, the visible surface of which is entirely work of the closing years of the last century. A closer survey, compared with documentary evidence, shows, however, that the buildings are essentially the same in which the school has been held, not only from the time of its refoundation by King Edward VI. in 1553, but from its original endowment by Thomas Jolyffe in 1482, and that some portions, in all likelihood, belong to the still older Guild-hall of the Guild of the Holy Cross, which formerly occupied the same site. . . . . The greater part of the buildings are solidly constructed of oak 'post and panel' work, the appearance of which down to a hundred years ago is shown from a drawing in the Fairholt collection at Shakespeare's birthplace, and resembling also a coloured sketch now in the possession of Alderman Colbourne, of Stratford-upon-Avon. The accuracy of this drawing is proved, among other ways, by comparing the disposition of timbers there represented with what actually exists under the present disguise of plaster. The 'rough cast' which now covers the walls of the main building was first put on in accordance with a resolution of the Town Council, dated February 15, 1786, which runs:—'Also it was agreed that the Guild-hall sh^{d}. be stripped, Tiled and rough Cast with regular Windows put in the front or in any other manner that the Corporation should hereafter think more proper & the same to be begun in one month from the date hereof.' This plaster-work is now much dilapidated, and instead of continuing to patch and repair it, it would be preferable, as adding very much to the beauty and interest of the building, if it were altogether removed, and the old timbering left visible. This still shows traces of the red and blue paint which once adorned it, and will again need some protection from the weather; but as a renewal of such gay colouring is now inadvisable, the wood should be oiled and the panels repaired with cement, which treatment, though not giving again quite the Mediæval, will certainly renew the Elizabethan aspect of the place, as it is to Queen Elizabeth's time that so much of the 'black and white' work, so familiar in Warwickshire, belongs. The timber on the whole is sound; but in some places near the ground, where it has suffered from damp, the parts which are quite decayed should be carefully replaced, and stone-work with a damp-proof course inserted beneath."

NEW CATHOLIC CHURCH, KIDSGROVE.—A new Catholic church, dedicated to St. John the Evangelist, has been commenced at Kidsgrove, Staffordshire, from the designs of Messrs. W. Sugden & Son, architects, Leek. It is of Perpendicular Gothic character, brick-faced inside and out, with yellow stone dressings, and purple tiled-roofs. Mr. Bromage, of Longton, is the builder.

OPENING OF A PAVILION, RHYL.—On the 12th inst., Lady Florentia Hughes opened a pavilion, which has been erected at Rhyl, Flintshire. The pavilion, which takes the form of a Maltese cross, is in the English Renaissance style, and consists of a large central hall on the ground floor, and one circular gallery or tier. The central hall is 50 ft. square, with three transepts, each 50 ft. by 20 ft. The platform is 50 ft. by 20 ft., with a large organ-chamber, which will contain the grand jubilee organ in use at the Manchester Exhibition. There are three entrances on the ground floor, and four exits from the gallery, which are constructed on approved principles, every door in the place opening outwards. Ten cast-iron columns, arranged in a semi-circle, support the raftered roof, which is fitted with a lantern light in the centre. Artistes'

retiring-rooms are arranged on each side of the orchestra, one for ladies and one for gentlemen, having separate entrances. The gas-lighting arrangements have been carefully considered, and are so arranged that each part of the interior lighting can be turned off separately from the others. It is intended to have approaches from the many promenades, and a circular promenade will be made round the building. The building will ultimately be crowned with a dome. The total cost of the structure, exclusive of fixtures, is 6,000*l.* The hall is ventilated by Tobin inlets, and arrangements have been made for heating the building in winter with hot water. The contractors were Messrs. Holme & Green, Liverpool, the architects being Messrs. Darbishire & Smith, of Manchester.

PROPOSED FREE CHURCH, MOTHERWELL.—Operations will shortly be commenced for the erection of a church in Windmillhill-street, Motherwell, Lanark, to be known as the South Free Church. The plans, which are by Mr. Alex. Cullen, Motherwell, show a structure in a Scotch development of Early English Gothic capable of holding 410 sittings, with back gallery, and so arranged that 500 additional seats can be added at any future time.

WESLEYAN CHAPEL, HARTFORD, CHESHIRE.—On the 9th inst. a new Wesleyan chapel in the Beech-lane, Hartford, was opened. The new chapel is a Gothic structure in brick, with a spire. The front gable is of Ruabon brick, while the dressings are of Manley stone. The principal entrance is by a doorway under the tower. The front gable has a three-light window with thirteenth-century tracery, containing stained glass. The roof is laid with slates of two colours. At the rear vestries and class-rooms are provided for. The interior, which will seat about 350, is fitted with seats in pitch-pine. The total cost is about 2,400*l.* Mr. Richard Beckett, of Hartford, was the builder, and Mr. John Wills, of Derby, is the architect.

CATHOLIC SEMINARY, WONERSH, SURREY.—On the 8th inst. a Catholic college, to be known as St. John's Seminary, was opened near Wonersh, Surrey. Accommodation is provided for 100 students and a large staff of professors and household attendants. The college is built of red brick, with Bath stone dressings, and its style is of the Early English Renaissance. The main building consists of a central block 150 ft. long by 42 ft. wide, with flanking wings 120 ft. by 34 ft. at each end. On the ground floor are capacious halls, called studies, a conference hall, or lecture theatre, a refectory, and numerous class-rooms. Upstairs, and reached by wide staircases at either end, runs a corridor, from which lead the library, the professors' hall, and other apartments. The buildings have been erected at a cost of nearly 30,000*l.*, by Messrs. Longley & Co., of Crawley, Sussex, from the designs of the architect, Mr. Fred. A. Walter, of London. A chapel has still to be erected at a cost of about 5,000*l.* more.

RESTORATION OF TOWER, CHEWTON MENDIP CHURCH.—The restoration of the tower of the parish church of Chewton Mendip, Somerset, is now completed. The work, which has been in progress since July, 1890, has embraced the entire rebuilding of the stair-turret and the embattlement at the top of the tower, and the partial rebuilding of the pinnacles. The bell-chamber has been strengthened with masonry, 16 in. thick, cramped to the exterior freestone, and the whole of the top story has been made secure by iron tie-rods from angle to angle, embedded in the masonry, and an oak wall-plate, a foot square, cramped into the main walls. The exterior has been extensively repaired, especially at the base, which had become very dilapidated. A lightning conductor, and a down pipe to carry the water from the roof, have been fixed. A door of oak, from the design of the late Mr. J. D. Sedding, takes the place of the old deal ones, and the large west window has been re-glazed with cathedral glass by Messrs. Bell & Sons, Bristol. The bells have been re-hung in a new oak frame, constructed by Messrs. Llewellins & James, Bristol. The entire cost has been over 1,000*l.*

OPERA HOUSE, ASHTON-UNDER-LYNE.—The new Theatre Royal and Opera House at Ashton-under-Lyne was opened on the 14th inst. The building is situated in Oldham-road. It has been built at a cost of 12,000*l.*, from plans and designs by Mr. Frank Matcham, of London, and Mr. John Robinson, of Ashton-under-Lyne, has been the contractor.

CATHOLIC CHAPEL, LLANDUDNO.—On the 10th inst. the Rev. Dr. Knight laid the foundation-stone of a new Catholic chapel, which is to be erected on a site adjoining Lloyd-street, Llandudno. The church, which is to be built from the designs of Mr. Edmund Kirby, F.R.I.B.A., Liverpool, by Mr. J. D. Williams, Knighton, Radnorshire, at a cost of 5,000*l.*, will be of Gothic design, with Yorkshire stone facings, and dressings of Runcorn stone. It will include two aisles, nave, baptistery, two side chapels, and a sanctuary, with Runcorn stone columns running along each side. The roof will be of pitch-pine, as will be the floor, the latter being laid with encaustic tiles in the nave and aisles. There will be a traceried window at the east end of the church. It is also intended to erect a presbytery at the end of the church as soon as the funds permit. The inside measurements of the church are 83 ft. by 42 ft.; of the sanctuary, 20 ft. by 11 ft. 3 in.; of the side chapels, 11 ft. 3 in. by 10 ft.; and of the baptistery, 12 ft. by 10 ft. The main entrance will be from Deganwy-street, and the church will be crowned with a tower, which at present will be left in abeyance.

PROPOSED EXTENSION OF DARLINGTON TOWN-HALL.—On the 26th ult., Colonel John Ord Hasted, R.E., Inspector of the Local Government Board, held an inquiry in the Council Chamber, Darlington, in reference to an application made by the Town Council to borrow 4,000*l.* for the extension of the Town-Hall and offices attached thereto, and also to borrow 1,700*l.* for the purposes of erecting a new bridge to the Park, street improvements, additions to the baths, &c.—With regard to the Town-Hall extensions, the Town Clerk explained that the present accommodation was altogether inadequate. The staff of the Borough Accountant had insufficient room, and also the clerks of the Borough Surveyor; while the Council Chamber and its appendages were not what was required. It was proposed to extend the buildings from the Town-Hall eastward 61 ft., and provide the necessary buildings, including a Council Chamber, a Mayor's Chamber, and committee-rooms.—Mr. Smith, the Borough Surveyor, explained the plans, &c., and Alderman Sedgwick spoke on the question, the Council regarding this as the best scheme to meet requirements, seeing that the town was not yet prepared to erect new municipal buildings. Mr. Meek examined the Surveyor to show that the works were inexpedient, and produced a requisition signed by nearly 300 people against it. He also called evidence, including Mr. George Marshall, builder, and Mr. G. G. Hoskins, F.R.I.B.A., architect, who opposed the scheme, the latter suggesting, till new municipal buildings were erected, that a small extension of the accountant's clerks' office be made. The Inspector, having taken evidence on this and the other proposed expenditure, and viewed the ground, the inquiry terminated.

WESLEYAN CHAPEL AND SCHOOLS, DONCASTER.—Memorial stones in the new schools now being erected on Nether Hall-road, Doncaster, were laid on the 27th ult. by Mr. Alderman Sanders. The buildings at present being erected comprise only a portion of the scheme ultimately proposed to be carried out. This includes, besides the school buildings and conveniences now in course of erection, a chapel, band-room, vestry, and caretaker's house. The chapel will stand on the ground at the junction of Broxholme-lane with Nether Hall-road, and will have a tower and spire at the corner, the caretaker's house being placed on the Thorne-road side of the school buildings. The school has been planned on the central-hall principle, with class-rooms arranged on either side, entered from the large room or assembly-hall, which is 51 ft. long and 32 ft. wide, exclusive of the recess for rostrum. The recess will be formed by a stone moulded arch, 18 ft. span across the opening, with a rose window in the wall behind. This window will be filled with stained glass, and, like the glazing, will be executed by Messrs. Kayll & Co., of Leeds. A moulded stone arcade is arranged on either side of the large room, carried by iron stanchions and stone responds; the voids of the arcades will be filled with glazed and moulded screens. The main lighting of this room is obtained from clearstory windows on each side, also from triple lancet windows in main front gable. The ceiling will be boarded and open timbered, with arched principals carried on stone moulded corbels, and ventilation will be provided for by two outlets in ceiling, communicating with gabled ventilators on each side of main roof, which will be covered externally with Penrhyn slates. The floors will be of solid wood block laid on concrete. The main entrance to the school will be from Broxholme-lane, and will open into a vestibule. To the right and left, access is obtained through swing-doors to the cloak-rooms, and passing these is the entrance to the assembly-hall. At one corner of this room, and approached by a passage, is a kitchen. The floors of lobbies, &c., will be laid in tiles. Underneath the room is placed the heating apparatus chamber. It will be supplied and fitted with the necessary appliances by Messrs. Musgrave, of Belfast. The sanitary arrangements have been well considered, and appliances will be supplied by Messrs. Adams, of York. Separate conveniences are provided for boys and girls, and are approached by passages on either side of large room. The exterior is being executed in pressed brick with stone dressings. The tower contains the staircase to gallery, and is lighted with a pair of lancet-windows in each case, and a rose window in the uppermost stage. The facing bricks throughout the building are those made by Messrs. Smith, of Skiers Spring, and the stonework of dressings is from the Lindley Quarries, Ancaster. The woodwork, generally, is to be of pitch-pine, varnished. The contractor for the whole of the work at present in hand is Mr. B. Wortley, and the architect of the entire scheme Mr. J. Greenhalgh Walker, of Doncaster.

LIVERPOOL ENGINEERING SOCIETY.—The members of this society will visit Norton Water Tower this Saturday, September 19. The party will leave Lime-street Station by the 1.30 p.m. train for Runcorn, and will drive thence, *viâ* the Mersey Crossing, to Norton, where an examination will be made of the Water Tower under the guidance of the engineer, Mr. G. F. Deacon.

SANITARY AND ENGINEERING NEWS.

PROPOSED NEW DRAINAGE SCHEME FOR AYR.—Mr. John Eaglesham, Burgh Surveyor, Ayr, has laid before the Ayr Town Council a scheme for the re-arrangement of the drainage system of the burgh, and the disposal of the sewage. Mr. Eaglesham points out that the sewage on the south side of the river debouches into the sea on the south beach from seven separate outlets, some of which are carried out beyond low-water mark. To carry all these beyond low-water would cost about 1,100*l.* Mr. Eaglesham proposes to divide the drainage system into two sections, one for the north and one for the south side of the river. With regard to the south section, he proposes to collect the sewage near the beach, and carry it out to sea at a point opposite Blackburn, known to fishermen as "Peggy's Rock," a distance of 700 yards to seaward of high-water mark. The cost of this work is estimated at 6,131*l.* With regard to the sewage falling into the river in its passage through the town, it is proposed to carry this across the river to the Newton or north system, at a cost of 1,100*l.* In designing a scheme for the north section, Mr. Eaglesham points out that the erection of a weir across the river below the new bridge would be necessary; and in estimating the cost of this section he has kept the cost of the weir in view. The level of the weir would determine the level of the main sewer on the north. To deal with the drainage of this section, he would construct a main intercepting sewer commencing at the old bridge, to pass along Harbour-street, to discharge at low-water to the north of the wet dock. The cost of this work would be 5,219*l.* Mr. Eaglesham also recommends the extension of the esplanade to the south end of the Low Green; and the completion of this work he estimates would cost 4,466*l.* The total cost of the proposed improvements recommended would be about 17,000*l.*

RESERVOIR, YNYSYBWL, GLAMORGAN.—There has just been opened at Ynysybwl, the Buarth-y-Capel Reservoir, the first portion of the scheme now in course of construction for the supplying of water to the neighbourhood. This reservoir, which has been constructed for the purpose of breaking the pressure of the larger one, situated at the upper part of the Clydach Valley, adjoining Darwonno Farm, has a diameter of 81 ft. 6 in., is capable of holding half a million gallons of water, with an available depth of 16 ft. This capacity is sufficient to supply the present population of Ynysybwl for fourteen days. The resident engineer is Mr. Donaghue, and the contractors are Messrs. Batchelor & Snowdon.

EXTENSION OF LINTRATHEN WATERWORKS, DUNDEE.—At a recent meeting of the Works Committee of the Water Commission, Dundee, Mr. Baxter, the Engineer, submitted an estimate of the cost of laying a second pipe between Pitnappie and Dundee, and of relaying upwards of six miles of the original pipe in the Valley of Strathmore, in which numerous bursts had occurred since it had been put down. Mr. Baxter explained that if the old pipe in the Valley of Strathmore were used as part of the second pipe between Pitnappie and Clatto the total cost of the works would be 60,165*l.*, but that if a new pipe was laid throughout the cost would be 62,854*l.*

FOREIGN AND COLONIAL.

FRANCE.—There is talk already of erecting a monument to M. Jules Grévy, the former President of the Republic.——The Direction des Beaux-Arts has divided among the provinces one hundred busts of celebrated men commissioned during the last thirty years by the State, but which have never till recently been executed in marble or bronze owing to insufficient funds.——The sculptor Rambaud has been commissioned to execute the equestrian statue of Bayard to be erected at Pontcharra.——The fête for the inauguration of the monument to Lamartine at Marseilles will take place in a few days.——The Conseil Général de l'Hérault has decided to erect at Montpellier a statue to the memory of Auguste Comte.——The town of Limoges purposes to raise a statue to the memory of Vergniaud, the great Girondist orator, who was executed in 1793, under the "Terror."——There is talk of opening at St. Petersburg a French Lycée, on the same system as those in Paris.——The French military engineers are occupied with the prolongation of the railway of Haut Sénégal, which is to be finished in the course of the year 1892.——It is announced that a "Maison du Peuple" is to be built at Montmartre, on the same system as those which exist in Belgium, especially at Brussels and Ghent, in which the revolutionary Socialist will find all that he wants, from a dining-room to a lecture-hall and a theatre.——The splendid bas-relief in bronze, by Dalou, representing Mirabeau at the meeting of the States-General in 1789, has just been put in its place in the Chamber of Deputies. It is 7 mètres long and 4 high. It has been cast *à cire perdue* by Gonon, and is surrounded by a frame of white Carrara marble.——The galleries which give access to the Musée Galliera are in course of completion. The interior decoration of the building will be commenced shortly.——The new Bourse du Travail, by M. Bouvard, which was to have been completed in October, cannot be ready till December, and the formal opening is put

CONTRACTS, AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor or Engineer.	Tenders to be delivered.
*Brick Building	Met. Asylums Board..	*Official*	Sept. 21
*Superstructure of New Offices, Manchester	Refuge Assurance Co.	A. Waterhouse & Son	Sept. 22
Urinal, Moulton-street, Strangeways	Manchester Corp.	do.	do.
*Broken Granite and Flints	Twickenham Loc. Bd.	G. B. Laffan	Sept. 23
Coastguard Station, Ballinacarrig	Dublin Bd. of Works	do.	do.
Schools, Washington, Durham	School Board	J. G. Cowe	do.
Portion of a New Line	Lancs. & Yorks. and G. N. Railways	*Official*	do.
Baptist Sunday School, Hull	do.	Mawson & Hudson	do.
Fish Hatchery, Roundhay-park, Lee is..	do.	Richardson & Simpson	do.
*Two Furnaces	Vestry of Mile End Old Town	J. M. Knight	do.
*Additions to the Patent Office	H. M. Works	*Official*	Sept. 24
9-inch Pipe Sewer, Plymouth	Plymouth Corporation	G. D. Bellamy	do.
Forming, &c. Penarth-road	Cardiff Corporation	*Official*	do.
*Granite Kerb and Pitches	Borough of Brighton..	F. J. C. May	do.
Re-laying Flooring of Church, Keith	do.	F. D. Robertson	do.
School Buildings, &c. Hunter's Bar	Sheffield School Board	C. J. Innocent	do.
Alterations, &c. Theatre Royal	Plymouth Corporation	G. D Bellamy	Sept. 25
*2,500 tons Granite	Walthamstow Loc. Bd.	*Official*	do.
Dwelling House, Nancherrow, St. Just ..	do.	H. White	Sept. 26
Alterations, &c. Leskinnick House, Penzance	do.	O. Caldwell	do.
Additions, &c. Forres Public School, Elgin	do.	Ross & Macbeth	do.
English Wesleyan Chapel, Pontypridd ..	do.	W. Jones	do.
*Purchase of Six Dust Vans	Norwich Sanitary Com	*Official*	Sept. 28
*Extension of Laundry Buildings, N. W. Hospital	Met. Asylums Board..	do.	do.
*Main Sewer Works	Belfast Corporation	do.	do.
Dwelling House at Danygraig Farm, Cwmtaff	Meyrick Estate Trstees	E. Lumley	do.
Water Supply Works, Law District	Lanarkshire C. C.	J. Tait	do.
Lighting Municipal Buildings by Electricity	Bradford Corporation	*Official*	do.
House and Shop, Morley	do.	T. A. Buttery	do.
Steel Girder Bridge, &c. near Cambuslang	Lanark District Com.	Crouch & Hogg	Sept. 29
*Pumping Station, &c. Pimlico	LondonCountyCouncil	*Official*	do.
*Making-up Road and Pipe Sewer	Barnet Local Board ..	W. H. Mansbridge	Sept. 30

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
To Sink a Pit, Penicuik	The Shotts Iron Co. ..	J. Love	Sept. 30
Extension of Water-works	The Clyde Waterworks Co.	E. Garlick	do.
Infirmary	Church Stretton Union	A. B. Deakin	do.
*Extension, &c. of Infirmary, West Norwood	Lambeth Guardians ..	S. R. J. Smith	do.
Cast-iron Tank, &c.	Wortley, U.R.S.A.	G. E. Beaumont	Sept. 31
Wesleyan Chapel, Martinstown, Dorchester	Rev. H. J. Quilter		Oct. 1
Extension of Running Shed, Belfast	Belfast and Co. Down Railway		do.
*Precipitation Tanks	Devizes U.S.A	F. G. Billingham	do.
*Boundary Wall	Islington Guardians..	W. Smith	do.
*Road Works	Bromley Union R S.A.	*Official*	do.
*Broken Granite, Gravel	Romford Loc. Bd.	do.	Oct. 3
*Stores, various	Gt. Western Railway	do.	Oct. 5
*Iron Staircases	City of London Union		do.
*New Workhouse	Guardians of Grimsby Union	H. C. Scaping	Oct. 6
*Front Improvement Works	Borough of Ramsgate	W. A. Valon, C.E.	Oct. 21
*Church and Vicarage, Hatcham	Haberdashers' Co.	H. Stock	No date
Extension, Corn, &c. Exchange, Manchester		Ball & Elce	do.
Wesleyan Schools, Holbeck		T. Butler Wilson	do.
Alterations, &c. to Hospital, Clun, Shropshire		F. R. Kempson	do.
*Sewerage Works, South Camp, Aldershot	War Department	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Chief Sanitary Inspector	Cape Town Corporatn	250*l.*	Sept. 30
*Surveyor and Inspector of Nuisances	Guildford Corporation	300*l.*	Oct. 3

Those marked with an Asterisk (*) are advertised in this Number. *Contracts, pp.* lv., vi., *and* viii. *Public Appointments, p.* xx., xxi.

off till then.——The carcase has just been finished of the great barrack building at Vincennes, to replace the Caserne Duplix and the Caserne Bonaparte, the old buildings which are to be pulled down. The new barracks will include fifty-two isolated blocks of buildings, with bath-rooms and workrooms for the troops. Every modern convenience has been studied. The cost is estimated at five or six million francs.——The death is announced, at Paris, of M. Moulin, a photographic artist, who did a great deal towards the popular progress of chromolithography.——The funeral of the late painter Delaunay was solemnly celebrated at Nantes.——The celebrated painter Theodore Ribot has died at Colombes, at the age of sixty-eight. We will take an opportunity of speaking of his art more at length than there can be space for here.——The inauguration of the statue of Garibaldi at Nice has been fixed for October 4.

BERLIN.—The International Art Exhibition, which was to have been closed on the 15th inst., will remain open until the 20th. It has not been possible to prolong the date until October 1, on account of many of the artists having promised to exhibit at other exhibitions, which are to be opened on that date.——The new Minister of Public Works intends making some great alterations in the regulation of the railway traffic passing through Berlin; the express and ordinary trains of the main lines will no longer be switched on to the metropolitan railway which runs through the town, but will start and arrive at a number of old terminal stations, which have survived from the time when the various railroads belonged to private companies. The metropolitan railway viaducts will only have the city and suburban trains pass over them, the possibility of switching main-line trains on to them, however, being retained for military or other special purposes.——The idea of building a second metropolitan railway, having the ordinary gauge, but running on metal viaducts and propelled by electricity, seems to be coming to the front, the electrotechnical engineers, Messrs. Siemens and Halske, having put some definite propositions, with estimates, before the Municipality. The idea of having this new means of communication in the town is very popular, owing to the great dissatisfaction about the present state of affairs.

MISCELLANEOUS.

TECHNICAL EDUCATION.—The Worshipful Company of Carpenters, in conjunction with the Council of King's College, have established at that College wood-carving classes. The day classes are held on Monday, Wednesday, and Friday afternoons, from two till five, and the evening classes on Mondays and Wednesdays, from seven till nine. Arrangements have been made by which ladies are permitted to attend, and prizes are offered by the Company. Particulars may be obtained from the Carpenters' Company, London-wall, or of the Secretary at King's College.——At the Polytechnic Institute, Regent-street, special courses of instruction in Building Construction, Carpentry and Joinery, Quantities, and Estimating are announced to be given by Mr. Charles F. Mitchell, and special lectures on Sanitary Engineering, by Messrs. J. W. Clarke and G. Taylor; on Brickwork and Masonry, by Mr. H. W. Richards; on Mineralogy, by Mr. W. F. Gwinnell, F.G.S.; and on the Chemistry of Building Materials, by Mr. R. Avey Ward.——From the City of London College, White-street, Moorfields, we have received the syllabus of lectures to be given in the Engineering Department by Professor Henry Adams during session 1891-92.——The Sanitary Institute also send us a list of lectures and demonstrations for sanitary officers, specially adapted for candidates preparing for the Institute's Examination for Inspectors of Nuisances.

COLLAPSE OF A NEW CHURCH.—Last year Princess Henry of Battenberg visited Barmouth, Merioneth, and laid the foundation-stone of a new church. The site chosen was an excavation in the huge limestone cliff overlooking the estuary, and a lofty tower formed part of the design. After a considerable part of the masonry had been erected it was found that some serious defect rendered the foundation unsafe. Great expense was then incurred in trying to strengthen the foundation by means of concrete buttresses, and the building was proceeded with. The roof had been got ready for the slates, and the tower had been built almost to its full height. Suddenly in the early morning of the 12th inst. the tower collapsed and fell into the nave. The loss is estimated at 5,000*l.* Messrs. Douglas & Fordham, the architects, attribute the catastrophe entirely to blasting operations with dynamite among the rocks immediately at the back of the church, operations undertaken in order to obtain more light for the church. The explosions had first shaken and eventually brought down the tower. Mr. Winnard, contractor, Wigan, will immediately begin the reconstruction of the tower and building.

REREDOS, PRESCOT CHURCH, LANCASHIRE:—There has just been erected in the Prescot Parish Church, a carved oak reredos from a design by Mr. C. E. Kemp, architect, London, the carving having been executed by Mr. Frith. On a black enamelled ground the figure of Christ on the Cross is depicted, showing the city of Jerusalem in the distance, whilst four panels, two upper and two lower, are occupied by representations of Isaiah, Jeremiah, Zachariah, and Micah.

ARCHÆOLOGICAL DISCOVERIES AT CHESTER.—The explorations now being conducted in the city walls of Chester, near the Northgate, are proving of considerable interest to archæologists. The work is being carried on under the auspices of the Cambridge University, and the operations are under the superintendence of Mr. J. M. Jones, City Surveyor, and a sub-committee of the Corporation. Two excavations have been made, resulting in the discovery of several inscribed, sculptured, and architectural monumental stones. The inscriptions on the stones are very legible, and one in particular, which it is believed has been erected to the memory of a lady, is in an excellent state of preservation. Above the inscription is a very perfect piece of sculpture, showing a recumbent figure on a couch, with a tripod table near by. Two doves stand on wreaths in the alcove, and in the ornamental border there are water nymphs trumpeting. The nymphs are curiously composed, having each a human body and head, four horses' legs, and a fish tail. The figure, which is believed to be that of a woman, holds what seems to be a scroll or a cup in her right hand. The stone is about 4½ ft. long and 2½ ft. broad. Another stone which has been found is to the memory of a veteran of the Roman Army, who appears to have put in his full time of service; whilst another inscription is believed to refer to the death of a soldier belonging to the 2nd Legion of the Roman Occupation; and if this is correct, it will undoubtedly be of historical interest. It has been asserted, and is generally believed, that the 20th Legion occupied the city; but it is a question whether the 2nd Legion was ever quartered in Chester. Other stones relating to soldiers of this legion have been found, and it was thought that these men must have died when the troops were passing through the city. The discovery, however, of another relic will doubtless reopen the question as to whether the walls are the work of the Romans. The discoveries will be located in the Chester Grosvenor Museum.—*Liverpool Post.*

PROPOSED LIGHTHOUSE, SULESKERRY, N.B.—According to the *Glasgow Herald*, the Government a short time ago sanctioned the erection of a lighthouse on Suleskerry, which is situate right in the track of vessels passing our northern coasts. The Commissioners of Northern Lights have accepted the tender of Mr. J. M. Aitken, contractor, Lerwick, to erect a lighthouse of the first class from 70 ft. to 75 ft. high, and also to build a block of dwelling-houses at Stromness, with accommodation for four keepers and their families.

THE ENGLISH IRON TRADE.—There is more activity observable in the English iron market and prospects appear a little brighter. Prices, however, show but few alterations. There is more business doing on the Glasgow warrant market, chiefly in hematite warrants, and the demand for Scotch maker's iron exhibits an improvement. Middlesbrough pig is active. Manufactured iron is also in better inquiry. There is more life in the steel trade; but steel rails still continue in a neglected condition. Tin plates remain quiet. Shipbuilders are in receipt of more orders, whilst engineers are fully well engaged. Coal is in good demand.—*Iron.*

HENGLER'S CIRCUS, ARGYLL-STREET.—By order of the trustees under the will of the late Mr. F. C. Hengler, this property will be sold by auction on the 23rd inst., on the premises. It consists of a leasehold tenure at 1,300*l.* annual rental, held for a term of thirty years from Midsummer-day, 1884. The "Cirque," which has replaced a former one on the same site, was opened by the late proprietor twenty years ago. It is stated that the building can be readily adapted to purposes of a theatre, concert-hall, or the like.

MEMORIAL WINDOW, MORVAL CHURCH, CORNWALL.—On the 11th inst. a new east window, in memory of the late Mr. J. F. Buller, was dedicated in Morval Church. The window has been erected by Messrs. Clayton & Bell, of London. The nephews and nieces of Mr. Buller have also erected a granite Cornish cross to his memory in the new burial-ground. The cross was designed, executed, and erected by Messrs. Freeman, of Penryn.

MEETINGS.

SATURDAY, SEPTEMBER 19.

Liverpool Engineering Society.—Excursion to Norton Water Tower, under the guidance of Mr. G. F. Deacon.

Glasgow Architectural Association.—Visit to Coats Memorial Church, The Abbey, &c., Paisley.

TUESDAY, SEPTEMBER 22.

Glasgow Architectural Association.—Visit to Mr. Anderson's house, Great Western-road. Mr. T. L. Watson, architect. 6 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

17,698.—WOODEN PAVING-BLOCKS: *R. Y. Ardagh.*—The blocks which are the subject of this patent are made of bars or prisms of wood, enclosed in an iron framework or clip. The wood is subjected to a preservative process before being placed in the clip, and to pressure in the clip to consolidate the whole; the blocks are laid in the usual way, the iron clips forming grooves, into which melted pitch or other binding material may be poured.

16,160.—CRANES, LIFTS, &C.: *J. W. Pateman.*—This relates to what claims to be an improved construction of self-sustaining apparatus, actuated by a clutch and studs, all moving with the wheel together; but if the weight or cage should overbalance the power applied to the hand wheel, the load is brought to a standstill by friction stops automatically working against the inner rim of the friction-wheel, stopping the motion of the shaft.

11,250.—MATERIALS FOR BRICKS: *E. A. Sorel.*—Different formulæ are given for bricks for different purposes, mainly using magnesia, chopped wood, or bark and a solution of chloride of magnesium, any degree of solidity, strength, or lightness being apparently obtainable by varying the proportions of these three ingredients.

11,524.—FIREPROOF BUILDINGS: *C. A. Day.*—To provide a fireproof floor, ceiling, or roof of simple and compact structure a series of strands or fabric, ordinarily of metal wire, is used. This network is dropped across the beams of the structure, and serves to sustain the mass of fireproof material by which the spaces between the beams are filled.

1,238. — CHIMNEY-COWL: *E. D. Hoyland.* — This chimney-cowl is conical in shape, with a spherical concavity externally raised about 5 in. or 6 in. above the shaft or pit, and slightly projecting beyond it, secured to the shaft by four wings. On the inside of the cone is a bonnet about two-thirds down, formed to coincide with the curvature of the cone externally.

10,218. SLABS OR TILES: *O. Böklen (Germany).*—The slabs or tiles which are the subject of this patent are made in lengths, so that they can be fastened in rows upon suitable framework, similarly to boards for covering parts of buildings or similar purposes. The tiles are made with an even surface on one side, and a number of ribs forming cells on the other. The slabs may be either straight, curved, or angular, according to requirements.

11,742.—ROOFING TILES: *J. W. Green.*—This invention consists mainly in providing French roofing tiles with a thicker fillet and rib, so as to prevent water getting under the tile, conducting it away, and affording a better gauge for laying the tiles in courses.

NEW APPLICATIONS FOR PATENTS.

August 31.—14,665, A. Brigg, Excluding Draught through windows.—14,685, H. Allison, Traps for Waterbasins.—14,686, H. Allison, Traps for Bath-tubs.—14,692, W. Worrell, Securing Doors, Windows, Gates, &c., which cannot be opened from the outside.—14,712, G. Couch, Window-sashes, frames, and fittings.

September 1.—14,731, T. Bentley, Radiators for Warming and Heating Buildings.—14,751, T. Jenner, Hinges.—14,765, E. Kleiner and others, Air-moistening and Ventilating.—14,773, S. Jennings and J. Morley, Waterclosets.—14,793, H. Holloway, Iron Wall Tied Brick, for the better binding together and strengthening of buildings.

September 2.—14,820, C. Henderson, Warming, Ventilating, and Lighting.—14,829, W. Thompson, Artificial Ventilation of Tunnels.—14,833, J. Pollock, Machinery for Carving Wood, Stone, &c.

September 3.—14,867, B. Binnington, Roofing Buildings.—14,877, W. Wilkinson, Composition for the Removal of Old Paint, &c.—14,900, J. Smith, Chimney Pots.—14,901, J. Smith, Door Fastener.—14,918, J. Guy, Manufacture of Tiles, Bricks, &c., and Machinery for same.

September 4.—14,948, H. Seiling, Paint.—14,952, J. Robertson, Interlocking Impervious Bricks.—14,966, J. Jones, Sash Windows.

September 5.—15,021, E. Wiman, Stoves.—15,041, Door Latches, &c.—15,042, W. Llewellyn and T. Dillon, Traps for Sewers, Drains, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

12,086, J. Mactear and D. Sutherland, Treating and Hardening Stone. — 12,912, W. Egglestone, Sanitary Traps.—13,196, H. Gardner, Sashes provided with Sliding Windows, &c.—13 651, A. Deslandes, Locks and Latches.—13,655, W. Hough, Suspending Sashes, and in appliances connected therewith to facilitate the reversal or removal for cleaning or other purposes.—13,899, S. Eddington, Machinery for Moulding Bricks and the like —13,968, R. Fletcher, Apparatus for Sanitary Flushing and the like.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

14,763, J. Hird and J. Ford, Improvements in and Fittings connected with Casement and Sash-windows, and such-like structures.—16,933, T. Dawson, Draught or Dust Excluders.—17,805, J. Bell, Door-latches.—7,105, J. Johnson, Cutting Stone.—12,911, S. Johnson, Mortice-lock-holder.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

SEPTEMBER 3.—By *Worsford & Hayward* (at Dover) "Little Everden Farm," containing 13a. 1r. 34p., f., Alkham, Kent, 510*l.*; A freehold residence, and 1a. 2r. 4p., Eythorne, r. 32*l.* 10s., 510*l.*; "The Beech Grove Dairy," Ewell, f., r. 19*l.* 10s., 390*l.*

SEPTEMBER 9.—By *E. & S. Smith*: 24 & 26, Maygood-st., Barnsbury, f., r. 55*l.* 4s., 475*l.*; 34, Maygood-st., and 18, Half Moon-cres., f., r. 46*l.*, 335*l.*; 36, Maygood-st., f., r. 36*l.* 8s., 230*l.*; 22, Almorah-rd, Islington, u.t. 61 yrs., g.r. 7*l.* 10s., 350*l.*—By *Protheroe & Morris*: Six freehold cottages, and 1a. 0r. 34p., Chingford-green, r. 101*l.*, 845*l.*; "Norton House," Wallwood-rd, Leytonstone, f., r. 30*l.*, 360*l.*

SEPTEMBER 10.—By *C. C. & T. Moore*: F.g.r. of 30*l.*, Queen's-sq., Isleworth, with reversion in 80 yrs., 500*l.*; f.g.r. of 40*l.*, Lady Gray-lane, Bexley Heath, with reversion in 78 yrs., 450*l.*; f.g.r. of 18*l.*, James'-pl., Haggerston, with reversion in 57 yrs., 250*l.*; 488, Bethnal Green-rd., Bethnal Green, f., r. 75*l.*, 1,300*l.*; 8, Hutchison-st., Whitechapel, f., r. 34*l.* 16s., 400*l.*; 23, White-horse-st., Stepney, f., r. 31*l.* 4s., 315*l.*; a plot of land, Parnell-rd., Old Ford, with iron chapel thereon, f., 380*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	9/0/0
Teak, E.I.. load	8/0/0	14/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/5/0	4/0/0
Birch, do.	2/5/0	4/5/0
Elm, do.	3/5/0	4/15/0
Fir, Dantsic, &c.	2/0/0	3/10/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/0/0	5/0/0
Lath, D'ntsic, fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland, 2nd & 1st std 100	8 0/0	10/0/0
Do, 4th & 3rd..	7/10/0	8/10/0
Do. Riga	6/10/0	8 0/0
St. Petersburg, 1st yellow ..	10/0/0	14/0/0
Do. 2nd yellow	8/10/0	9/10/0
Do. white	7/0/0	10/0/0
Swedish	7/0/0	15/10/0
White Sea	8/10/0	17/0/0
Canada, Pine 1st	13/0/0	25/0/0
Do. do. 2nd....	9/0/0	16/0/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce. 1st	8/0/0	10/10/0
Do. do. 3rd & 2nd.....	6/0/0	7/15/0
New Brunswick	5/10/0	7/10/0
Battens, all kinds	3/10/0	15/10/0
Flooring Boards, sq., 1 in. prep. 1st	0/8/0	0/14/0
Do. 2nd.....	0/7/6	0/11/0
Other qualities	0/3/0	0/8/0
Cedar, Cuba ..ft.	/4	/4½
Honduras, &c.	/4	/4½
Mahogany, Cuba.	/4½	/0
St. Domingo, cargo AV	/4½	/6½
Mexican do. do	/4½	/5
Tobasco do. do	/5½	/7
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	18/0/0
Satin, St. Domingo ....ft.	0/0/9	0/1/3

TIMBER (*continued*).		
Satin, Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Pig, in Scotland .....ton	47/4/0	47/6/0
Bar, Welsh, in London.....	6/0/0	6/2/6
Do. do. at works in Wales	5/10/0	5/12/6
Do. Staffordshire, in London	6/10/0	6/15/0
COPPER—British, cake and ingot	54/10/0	56/0/0
Best selected ..	56/0/0	57/10/0
Sheets, strong..	65/0/0	66/0/0
Chili, bars	53/0/0	53/7/6
YELLOW METAL lb.	0/0/5½	0/0/6½
LEAD — Pig, Spanish....ton	12/5/0	0/0/0
English, com. brands	12/7/6	12/10/0
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/0/0	0/0/0
Pipe	14/10/0	0/0/0
ZINC — English sheet .....ton	27/0/0	0/0/0
Vieille Montagne.....	27/10/0	0/0/0
TIN—Straits	91/12/6	92/0/0
Australian	91/12/6	92 0/0
English Ingots	94/10/0	95/0/0
OILS.		
Linseed .....ton	19/17/6	20/2/6
Cocoanut, Cochin	30/0/0	0/0/0
Do. Ceylon	25/10/0	0/0/0
Palm, Lagos	25/10/0	0/0/0
Rapeseed, English pale	30/10/0	0/0/0
Do. brown	29/10/0	30/0/0
Cottonseed ref...	20/0/0	0/0/0
Oleine	0/0/0	0/0/0
Lubricating, U.S.	4/10/0	5/10/0
Do. refined	6/0/0	11/0/0
TAR—Stockholm barrel	0/18/6	0/19/0
Archangel	0/12/0	0/12/6

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BECKENHAM.—For the erection of shops, studios, &c., at High-street, and Albemarle-street, Beckenham, Kent, for Mr. E. Cooper. Mr. G. Warren Cooper, architect, Bedford-row, W.C. Mr. A. R. Brede, Surveyor:—

Charteris	£4,650	Higgs	£4,079
W. Downs	4,370	Goodall	4,026
B. E. Nightingale	4,196	Pocock	3,933
Graham & Co.	4,150	Wallis & Son	3,829
Jerrard	4,127	Mid-Kent Building Works*	3,700

* Accepted.

BECKENHAM.—For the erection of coach-houses, at the "Railway Hotel," Beckenham. Mr. G. Warren Cooper, architect, Bedford-row House, Bedford-row, W.C.:—

Webb (accepted) £450 0 0

BLAENGARW.—For sewerage and drainage works, for the Ogmore and Garw Local Board. Mr. H. Dawkin Williams, surveyor, Blackmill, Ogmore Vale, Bridgend:—

Parker & Co.....	£2,700 3 3	Jenkins Bros. Swansea (accepted)	£1,919 10 0
D. Evans	2,583 16 0		

BRIDGEND.—For the erection of a Drill-hall, Coity-street, Bridgend. Mr. P. J. Thomas, architect, Bridgend:—

Wm. Francis	£1,090	Chas. Jenkins & Son, Bridgend*	£730
Chas. James	770		
P. Gaylard.....	732		

* Accepted.

CLIFTON.—For work in alterations and repairs at No. 31, Berkeley-square, Clifton, near Bristol, to accommodate the Kensington School of Art. Messrs. J. W. Trew & Sons, architects, Broad-street, Bristol:—

Thorley, Son, & Derrick	£255 15	T. Webley	£206 6
Jno. Perry (withdrawn)..	217 16	Geo. Elmes (accepted)....	189 0

[All of Bristol.]

COLWALL (near Malvern).—For the erection, exclusive of fittings, of hunting stables, for Mr. R. Cave Browne Cave. Mr. G. H. Godsell, architect, Palace-chambers, Hereford:—

W. Wilcox (accepted) £1,322 0 0

[No competition.]

EPPING.—For alterations and additions to the Epping Police-station, for the Essex County Council. Mr. H. Stock, County Surveyor:—

Palmer Bros.	£850 0 0		
W. Lawrence, Waltham Abbey (amended)*	787 0 0		

* Accepted.

HEREFORD.—For iron shedding to be erected at the Working Boys' Home. Mr. G. H. Godsell, architect, Palace-chambers, Hereford:..

J. Morley	£130	Perkins & Bellamy, Ross* ..	£125
Harding & Sons	128		

* Accepted.

KIDSGROVE.—For erecting St. John the Evangelist Catholic Church, Kidsgrove, Staffords. Messrs. W. Sugden & Son, architects, Leek. Quantities by the architects:—

P. S. Bromage, Longton..... £1,772 13 0

[Exclusive of altar, font, and dedication, stained window. Accepted with modifications.]

LEDBURY (Hereford).—For drainage works to Bronsil House, near Ledbury. Mr. G. H. Godsell, architect, Palace-chambers, Hereford:—

W. P. Lewis & Co., Hereford*..... £220 0 0

* Accepted: no competition.

LEDBURY (Hereford).—For water supply to Bronsil House, Ledbury. Mr. G. H. Godsell, architect, Palace-chambers, Hereford:—

W. P. Lewis & Co., Hereford*..... £197 0 0

* Accepted: no competition.

LLANTRISSANT (Glamorgan).—For alterations and additions of Gilvach Goch Board Schools, for the Llantrissant School Board. Mr. J. J. Evans, architect:—

Lemuel Evans, Tonyrefail* £650 0 0

* Only one tender obtained, owing to pressure of work and scarcity of men in this district.

LEEK.—For rebuilding and excavating dye works at Upper Hulme, for Mr. W. Tatton. Messrs. W. Sugden & Son, architects, Leek. Quantities supplied by the architects:—

Excavator, Bricklayer, Stone Mason, &c. (*Proprietor finding brick and stone*).

Bromage.....	£840	Grace	£800
Comes.....	840		

[The proprietor is doing the above section himself.]

Roof Timbering.

Grace (accepted) £96 0 0

[The proprietor does floors and joinery himself.]

Roof Tiling.

Carter, Congleton (accepted)..... £106 0 0

Plumber, Glazier, and Painter.

Comes..	£97 10 0	M. Carding.....	£86 0 0
G. T. Stevenson	96 6 0	Isaac Heath (accepted)	81 10 9

LONDON.—For the erection of six shops opposite Gloucester-road Station, South Kensington, for Mr. Aldous. Mr. George Edwards, architect, 32, Cannon-street, E.C.:—

Martin & Wells	£3,999	Stevens	£3,465
Aldin Bros. & Davies.....	3 945	Knight & Co.	3,440
Leslie & Co.	3,784	Barnett	3,425
Tostén & Sons	3 739	Ward & Lamble	3,391
J. Mears.....	3,625	C. Wall	3,350
Canning & Mullins.....	3,600	Scharieu & Co.....	3 298
Toms	3,567	Stimpson & Co.*	3,280
Crask	3,426		

* Accepted.

LONDON.—For the erection of stabling at Blackheath, for Mr. Thomas Tilling. Messrs. Jarvis & Son, architects:—

Nicholls.....	£4,303	Burman	£3,750
Brass & Sons	4,283	Jerrard	3,689
Hart Bros.	4,169	Barker	3,652
F. & H. Higgins	3,900	Kennard Bros.....	3,651

LONDON.—For wood-paving, Dawes-road, Jerdan-place, Vanstone-place, and Melmoth-place, Fulham (about 9,600 square yards creosoted deal blocks, and 542 square yards Jarrah), for the Vestry of the Parish of Fulham. Mr. James P. Norrington, Surveyor to the Vestry:—

Nowell & Robson	£6,989	Improved Wood Paving Co.	£6,460
Turner & Son	6,950		
Tomes & Wimpey	6,649	E. Parry.....	6,250

LONDON.—For underpinning and repairs to house at 13, Salisbury-street, Lisson-grove, for the Magnet Building Society. Mr. E. Ashbridge, surveyor:—

J. Redley	£125	Cross & Sons.....	£117

LONDON.—For structural alterations to 31, Nottingham-place, W., for Mr. J. Chaplin. Mr. Thomas Durrans, architect:—

E. Howard.....	£3,549	H. C. Clifton	£2,975
S. Bird	3,317	J. Myring & Co.	2,945
D'Oyley & Co.	3,292	Manktelow & Co.....	2,727
Foxley & Co.....	3,039	J. Edgar.....	2,700

LONDON —For additions to studio, 20, Upper Baker-street, N.W., for Mr. A. Ellis. Mr. Thomas Durrans, architect, 44, Upper Baker-street, N.W.:—

Head & Co.....	£180 0	H. C. Clifton	£150 0
J. Edgar	167 15		

LONDON.—For alterations to business premises, 45, Upper Baker-street, N.W., for Mr. G. S. Beeching. Mr. Thomas Durrans, architect:—

H. C. Clifton £210 0 0

LONDON.—For alterations to No. 1, Upper Hamilton-terrace N.W., for Miss Ruff. Mr. Thomas Durrans, architect:—

Durrans & Sons.....	£298 10	H. C. Clifton	£288 0
Head & Co.	295 15	J. Myring & Co.	275 0

LONDON.—For additions to 19, Nottingham-place, Marylebone, W., for Mr. J. Chaplin. Mr. Thomas Durrans, architect:—

Gould & Brand.....	£2,350	Pocock	£2,233
Myring & Co.	2,350	Spencer & Co.	1,960
G. E. Todd.....	2,289	H. C. Clifton	1,940

LONDON.—For structural alterations to 33, Beaumont-street, Marylebone, W., for Mr. W. Burton. Mr. Thomas Durrans, architect:—

E. Howard.....	£1,798	Savage & Co.....	£1,480
J. Myring & Co.	1,600	H. C. Clifton	1,385
T. Stevenson.....	1,565	J. Edgar.....	1,260
Manktelow & Co.	1,562		

LONDON.—For reinstating shop at the corner of Blanche-street, Hermit-road, Canning-town, E., for Mr. Warne. Mr. A. J. Dale, architect and surveyor, Barking-road, Plaistow:—

Keene	£157 0	J. G. Horlock	£150 0
J. H. Johnson	155 0	G. Goodchild (accepted)..	109 18

LONDON.—For alterations and additions to the "Eagle" public-house, Tottenham, N., for Mr. T. F. Barlow. Mr. John E. Pinder, architect, Bridge House, South Tottenham, N.:—

Yardley & Sons	£533	Hy. Knight & Son*	£495
F. Voller	520	J. Groves	373

* Accepted.

LONDON.—For alterations and additions to 42, Hatton Garden, E.C., for Mr. C. S. Harris. Mr. Barnard, architect, 77, Knightrider-street, E.C.:—

Heyworth & Son	£319 0	Spencer & Co.*	£242 0
Johns & Smith.....	261 10		

* Accepted.

LONDON.—For the erection of a new central library at Brixton, for Mr. H. Tate, J.P. Mr. Sydney R. J. Smith, architect:—

	Building.		Fittings.
Mowlem & Co.....	£12,578	....	£1,433
Hall, Bedall, & Co.....	11,390	....	1,524
Candler & Son	11,200	....	1,500
Higgs & Hill.....	10,964	....	1,490
B. E. Nightingale	10,950	....	1,407
F. & H. Higgs	10,600	....	1,320

LONDON.—For executing repairs, &c., to the Church of St. Olave, Hart-street, E.C. Mr. Ewan Christian, architect. Quantities by Mr. J. O. Abbot:—

B. E. Nightingale	£1,584	Charteris	£1,236
Ashby & Horner	1,389	Dove Bros.....	1,175
Holloway Bros.	1,281		

LONDON.—For building premises, Nos. 220 and 221, Blackfriars-road, S.E., for Mr. J. Buck. Mr. W. Campbell Jones, architect:—

Lidstone	£3,006 17	W. Downs	£2,640 17
B. E. Nightingale.....	2,748 17	J. Smith & Sons.....	2,579 0
Holloway Bros.	2,711 17	Furner & Co.	2,498 17

LONDON.—For the erection of warehouses, Nos. 79 and 79A, Watling-street, E.C., for Messrs. Williams & Son. Messrs. T. Chatfeild Clarke & Son, architects. Quantities by Messrs. Leonard & Clarke:—

Woodward & Co.....	£3,115	J. Smith & Sons	£2,745
E. Lawrence & Sons	2,994	B. E. Nightingale	2,678
Ashby Bros.....	2,896	McCormick & Son	2,643
Philips & Bisiker	2,890	Killby & Gayford	2,533

LONDON.—For erecting proposed vestry-house, St. Olave's, Old Jewry, E.C. Mr. Ewan Christian, architect. Quantities by Mr. J. O. Abbot:—

B. E. Nightingale	£2,990	Hollingsworth	£2,882
Cornish & Gaymore	2,979	Charteris	2,862
Holloway Bros.	2,969	Roberts	2,842
Dove Bros.....	2,895		

LONDON.—For erecting premises, Nos. 115 and 116, Leadenhall-street, E.C., for Mr. C. W. Cayzer. Mr. E. B. Ellis, architect. Messrs. Leonard & Clarke, surveyors :—

Greenwood & Co.	£6,895	Morter	£6,288
Walker Bros.	6,749	Shepherd	6,228
Colls & Son	6,679	Woodward & Co.	6,156
Spencer	6,545	C. Wall	6,185
B. E Nightingale	6,514	Perry & Co.	6,110
Grover	6,350	Ashby & Horner	6,070

LONDON.—For rebuilding No. 67, High-street, Borough, S.E., for Messrs. W. H. & H. Lemaÿ. Mr. W. E. Stoner, architect :—

Clarke & Bracey	£7,857	Downs	£6,977
Brass & Son	7,484	Stimpson	6,960
B. E. Nightingale	7,333	Colls & Sons	6,800
Brown, Son, & Blomfield	7,150	Perry & Co.	6,728
Morter	6,990	Patman & Fotheringham	6,663

OXFORD.—For the erection of stables, shedding, and other buildings, for the Corporation of Oxford, according to plans prepared by Mr. W. H. White, the City Engineer :—

W. Polley	£1,897 2 0	W. H. Simonds	£1,629 0 0
S. Hutchins	1,675 0 0	Parnell & Co., Rugby (accepted)	1,628 16 7
C. Bossom	1,640 0 0		

PRESTEIGNE (Radnorshire).—For the erection of farm buildings at Whitewall Farm, for Lady Brydges. Mr. G. H. Godsell, architect, Palace-chambers, Hereford :—

John Price, Presteigne (accepted) £800 0 0

RHONDDA VALLEY.—For the erection of a shop and house at Pentre, for Mr. B. A. George, Pentre. Mr. J. J. Evans, architect, Sunnyside, Penarth. Quantities by the architect :—

Lemuel Evans, Tonyrefail* £1,297 0 0

* Only one tender obtained, owing to pressure of work and scarcity of men in this district.

SUTTON (near Hereford).—For the erection of new class-room and other alterations, for the School Board Committee. Mr. G. H. Godsell, architect, Palace-chambers, Hereford :—

James Davies	£398 0	W. P. Lewis & Co.	£195 10
Aldridge	339 0	R. Andrews & Son, Hereford*	195 0
Jas. Lloyd	215 0		
J. J. Davis	189 10		

* Accepted.

SWANSEA.—For the erection of a grand stand, for the Swansea Cricket and Football Club. Mr. H. C. Portsmouth, architect, Swansea :—

	Stand only.	Dressing-rooms.
J. D. Williams	£1,635	£235
Thomas Watkins & Jenkins	1,610	217
Bennett Bros.	1,520	210
W. Williams	1,488	215
T. Richards	1,453	200
Weaver Bros.	1,323	172

WALTHAM ABBEY.—For the erection of two houses on the "Green Man" estate, for Mr. J. Smith :—

G. Bentley	£450 0 0
W. Lawrence, Waltham Abbey (accepted)	435 0 0
T. Pollitt	430 0 0

WETHERAL (Cumberland).—For building a cemetery chapel and entrance gates at Wetheral, for the Wetheral Burial Board. Mr. A. W. Johnston, architect, 27a, English-street, Carlisle :—

Builder—Fisher, Wetheral	£388 6 11
Carpenter and Joiner—Hindson, Carlisle	127 0 0
Slater—Graham, Carlisle	25 15 0
Plasterer—Fergueson & Sons, Carlisle	28 0 0
Plumber—W. Forster, Carlisle	18 7 6
Smith and Bellhanger—Gouge, Carlisle	30 18 6
Painter and Glazier—Canning, Carlisle	26 0 0
Total	£644 7 11

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TO CORRESPONDENTS.

E. S. G. (thanks).—C. W. (shall have attention).—R. M., jun. (cheap, but useless).—R. G. H. (next week).—H. L.—P. G. S. (thanks).—W. S. B. (no space this week).—J. S. & Co.—A. P.—C. N. L. (next week).—T. R. (too late).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses

NOTE.—**The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.**

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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Registered Telegraphic Address, 'THE BUILDER,' LONDON.

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

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			[1891.]
I.	*CANTERBURY, Drawn by	*The Editor*	Jan. 3.
II.	LICHFIELD "	*W. H Bidlake*	Feb. 7.
III.	ST. ALBAN'S "	*H. W. Brewer*	Mar. 7.
IV.	PETERBOROUGH "	*A. Mitchell*	April 4.
V.	WELLS "	*R. W. Paul*	May 2
VI.	EXETER "	*A. N. Wilson*	June 6.
VII.	SALISBURY "	*The Editor*	July 4.
VIII.	BRISTOL "	*R. W. Paul*	Aug. 1.
IX.	NORWICH "	*S. K. Greenslade*	Sept. 5.
X.	ROCHESTER "	*H. W. Brewer*	Oct. 3.
XI.	LINCOLN "	*John Begg*	Nov. 7.
XII.	GLOUCESTER "	*C. E. Mallows*	Dec. 5.

[Further arrangements will be duly announced]

* This number is *out of print*, but to prevent disappointment to those desirous of possessing the series complete, the VIEW, PLAN, AND DESCRIPTION have been re-printed, and they can now be had, price ONE SHILLING; by post, 1s. 2d.

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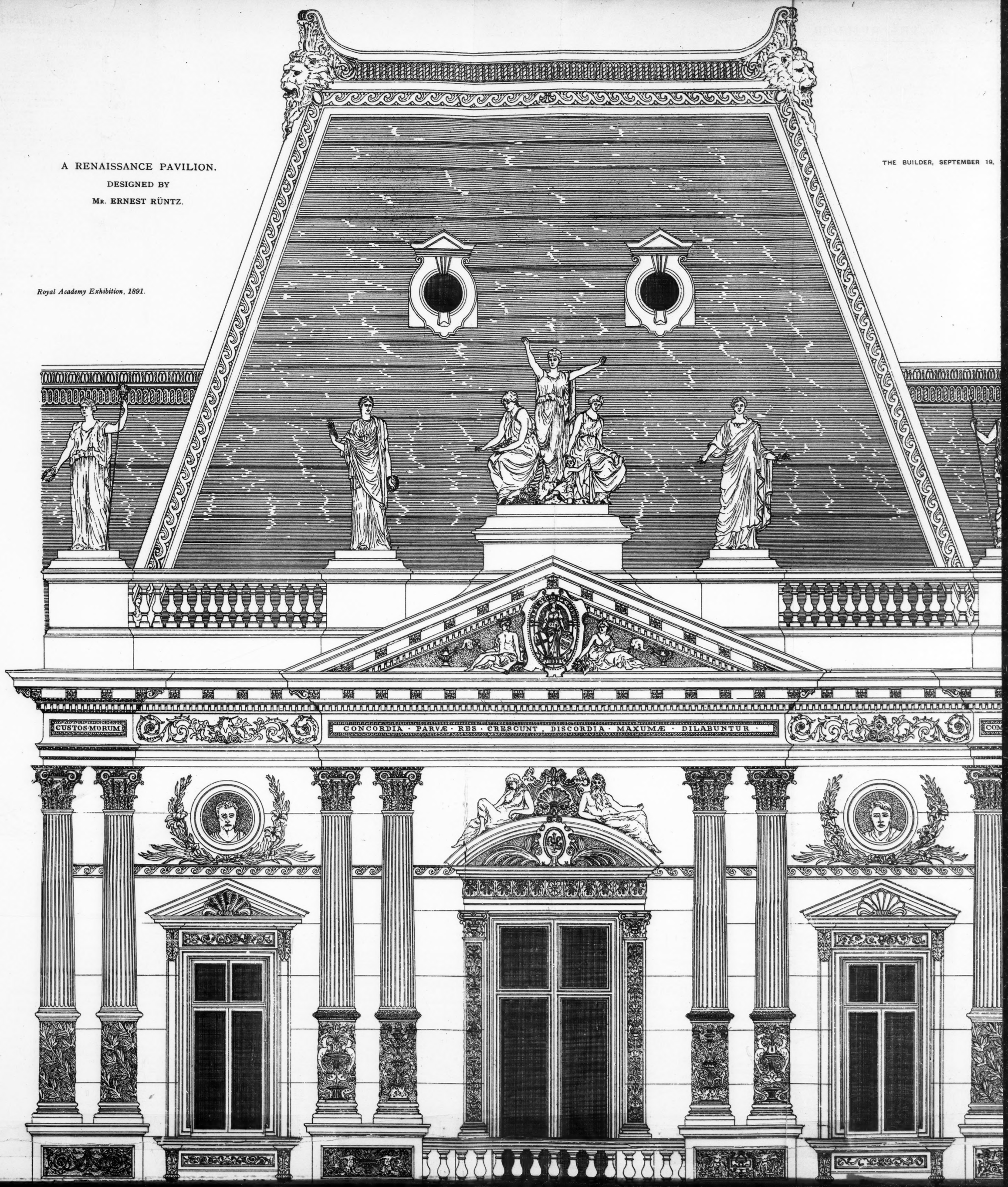
Royal Academy Exhibition, 1891.



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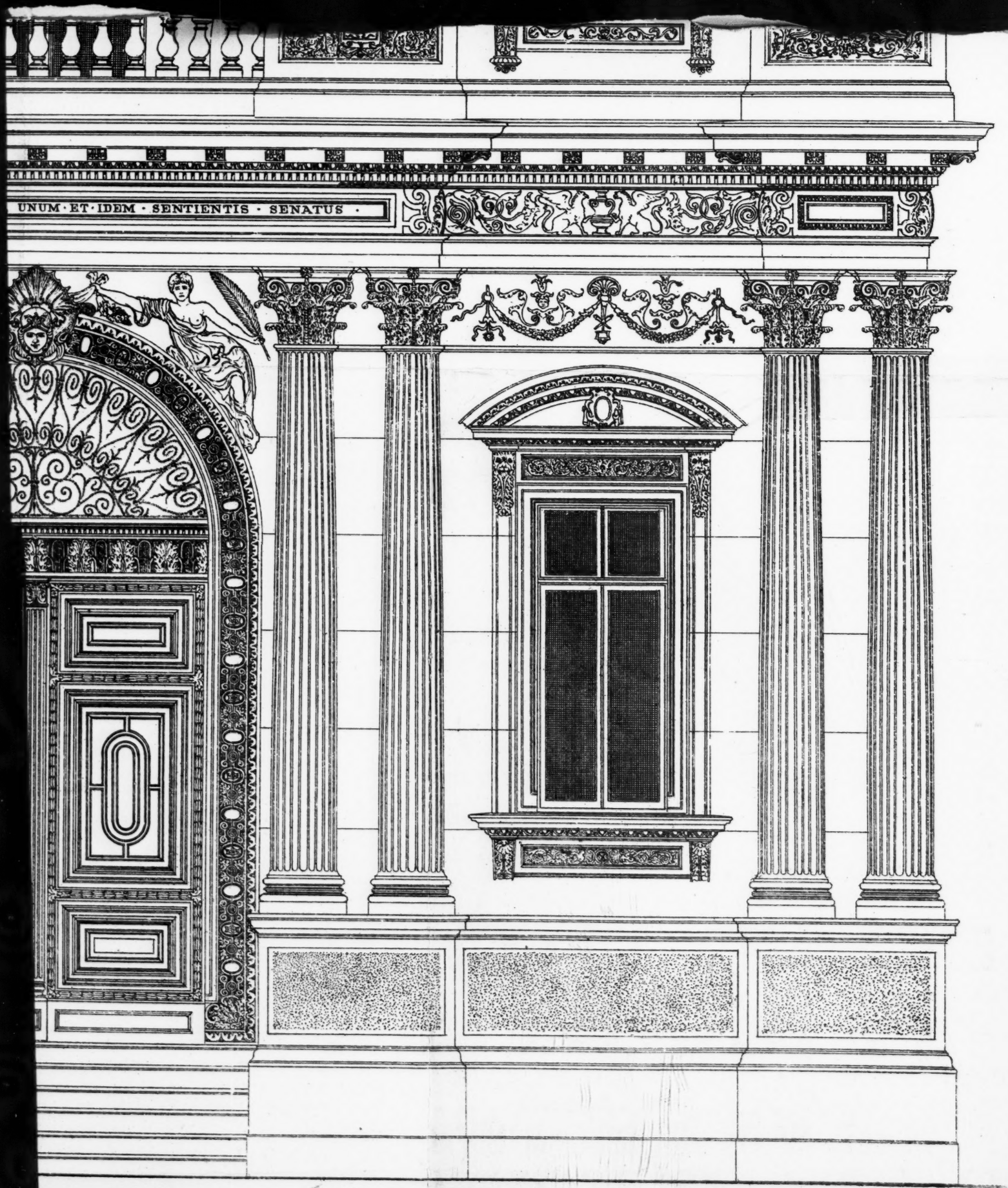

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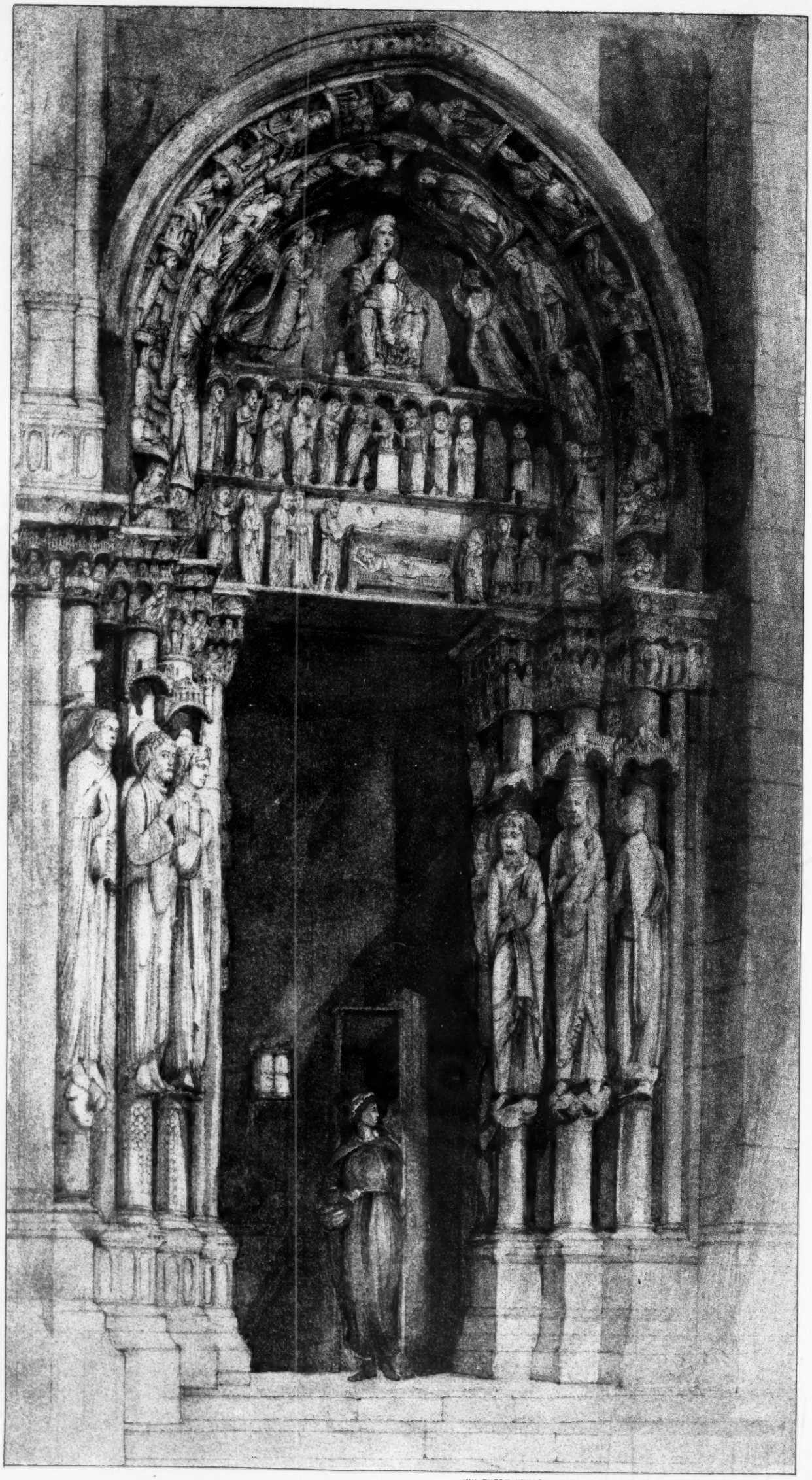

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CHARTRES CATHEDRAL: WEST DOORWAY.—From a Drawing by Mr. H. Wilson.
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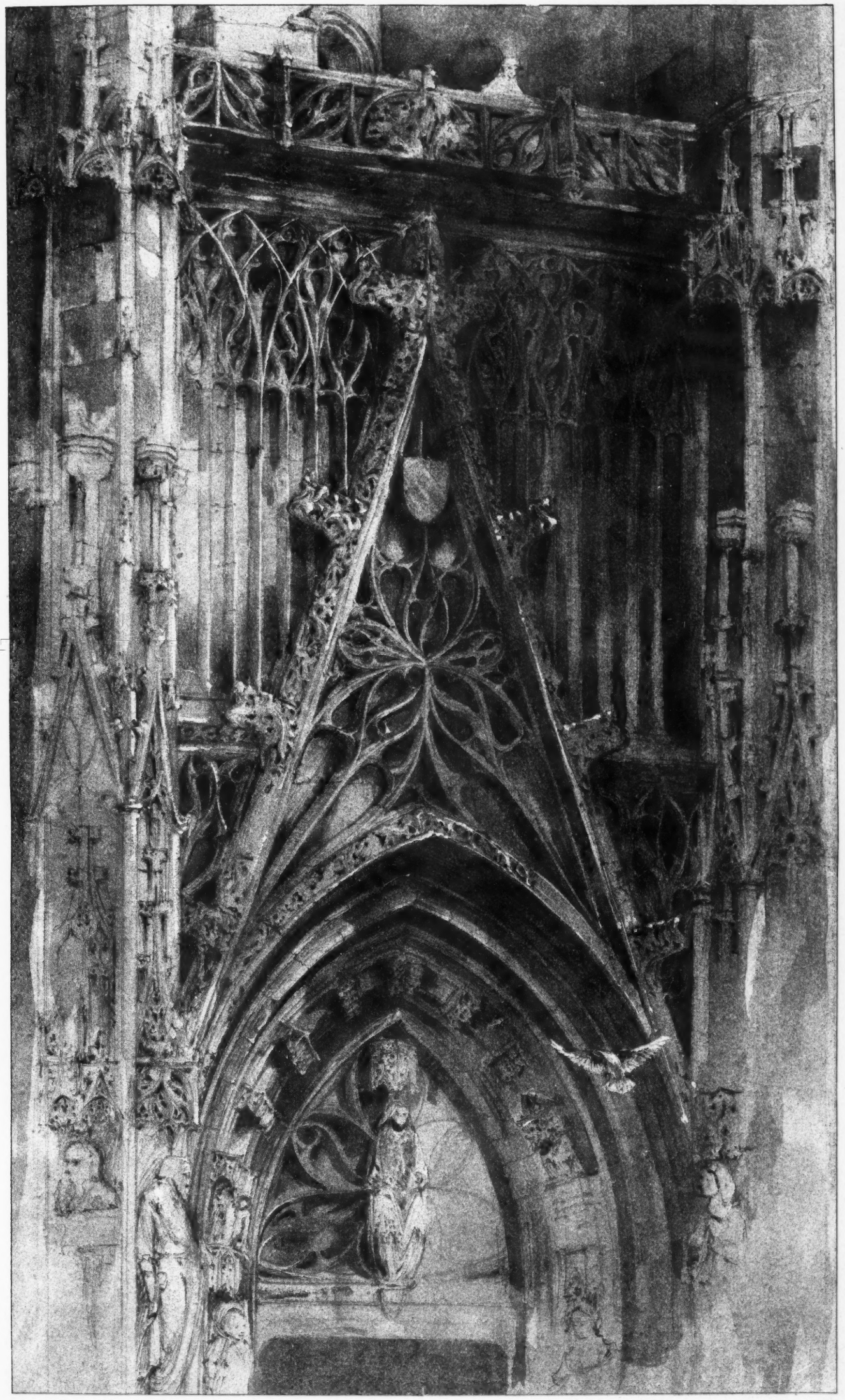

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